

UNISYS

A Series
Remote
Job
Entry
(RJE)

**Operations
Reference
Manual**

Relative to Release
Level Mark 3.6.0

Priced Item

December 1985
Distribution Code SE
Printed in U S America
1169828.360

UNISYS

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CONTENTS

1	INTRODUCTION	1
	GENERAL DESCRIPTION.	1
	SCOPE OF THIS MANUAL	1
	STRUCTURE OF THIS MANUAL	2
	RELATED DOCUMENTS.	4
2	OVERVIEW	5
	BASIC CONCEPTS	5
	DESIGN CONSIDERATIONS.	7
	Communications Line Interface.	7
	Line Interface Implementation.	8
	Functional Interface	17
3	USER INTERFACE	21
	INITIALIZATION	21
	SECURITY CONVENTIONS	21
	RJE LOG-ON/LOG-OFF	21
	REMOTE DECKS	22
	REMOTE SUPERVISORY CONSOLE (RSC)	23
	OUTPUT MESSAGES.	23
	Local Messages	23
	Log-on and Log-off Messages.	24
	RJE Output Messages.	28
	System Output Messages	28
	INPUT MESSAGES	29
	RJE Input Messages	29
	RJE Control Messages	29
	ODT Input Messages	30
	BACKUP FILE HANDLING	31
	HOST-TO-HOST COMMUNICATION	32
	File Transfer.	32
	RJE Messages for File Transfer	37
	Terminal Transfer.	39
	RJE Messages for Terminal Transfer	41
	RJE Terminal Transfer Session Example.	42
	HALT/LOAD EFFECTS.	46
	RJE HALT/LOAD RESTORE.	46
4	RJE INPUT MESSAGES	53
	INTRODUCTION	53
	*ACCESS.	54
	*BACKUP.	55
	BYE.	58
	*CE.	60
	*CHARGECODE.	65
	*CLEAR	66
	*CT.	67
	*DL.	69
	*DP.	70

DS	71
*DT.	72
*FM.	73
*LC.	75
*ME.	76
NOPASSWORD	78
*PB.	79
*PER	82
*PH.	83
QT	84
*RE.	85
*RO.	87
*RS.	88
*SB.	89
*SF.	90
*SM.	92
*SO.	94
*SP.	96
*SS.	98
*STATUS.	99
*TF.	101
*TO.	102
*US.	103
*WM.	104

5	RJE CONTROL MESSAGES	105
	INTRODUCTION	105
	ABORT.	107
	ATTACH	109
	BUG.	110
	CLEAR.	112
	COPY	113
	DP	117
	FTS.	118
	HEADLINE	121
	HELP	123
	HI	124
	LEVELS	125
	OFFLINE.	126
	ONLINE	128
	PH	130
	QUIT	132
	READY.	133
	RELEASE.	134
	RO	135
	RSC.	136
	SAVE	137
	SF	138
	SO	140
	SPO.	144
	SS	145
	TF	146
	VS	147

	WAIT	149
	WHERE.	150
	WM	152
6	MCP INTERFACE.	153
	INTERFACE CHARACTERISTICS.	153
	PATHCONTROL Task Attributes.	154
	ODT REQUESTS	155
	JOB DECKS.	157
	BACKUP	158
	INTERFACE MESSAGES	159
	WFL Card Image (Variant = 1)	159
	RJE Operator Request (Variant = 2)	160
	CONTROLLER Reply (Variant = 3)	161
	Next Message (Variant = 4)	162
	Task Message (Variant = 5)	162
	Status Change (Variant = 6).	163
	Unsolicited Message (Variant = 7).	164
	BOJ/BOT Message (Variant = 8).	164
	Scheduled Message (Variant = 9).	165
	Restarted Message (Variant = 10)	165
7	RJE COMPILATION.	167
	RJE COMPILE-TIME OPTIONS	167
	SOURCE RJE DEFINES	169
	COMPILING THE RJE MCS.	170
A	SAMPLE RJE SESSIONS.	171
	INTRODUCTION	171
	B 771 EXAMPLE.	171
	TERMINAL AND FILE TRANSFER EXAMPLE	176
B	ODT INPUT MESSAGES	183
	INTRODUCTION	183
	BASIC CONSTRUCTS	183
	ODT MESSAGES	187
	A.	187
	AX	188
	C.	188
	CS	189
	CU	189
	DBS.	190
	DQ	190
	DS	191
	DUMP	192
	FA	193
	FORM	193
	FR	193
	HI	194
	HN	194
	IB	195
	ID	195
	J.	196

LJ	197
LL (B 5000/B 6000 Series Systems with MPX)	197
LOG.	197
ML	198
MM	198
MSG.	198
MX	199
NET.	200
NS	200
OF	201
OK	201
OL	201
OP	202
OT	204
PD	205
PER.	206
PF	206
PR	207
PV	207
QF	208
QT	208
RM	208
S.	209
SB	210
SC	210
SI	210
SL	211
SP	211
SQ	212
SS	212
ST	213
SUPPRESS	214
TD	214
TERM	215
TF	216
THAW	216
TI	217
UQ	217
W.	218
WM	219
WY	220

C	NDL/NDLII DEFINITIONS.	221
	CONFIGURATION.	221
	RJE NDL DEFINITIONS: B 6800 SYSTEM	222
	Control and Request Procedures	222
	Terminal Declarations.	222
	Station Declarations	224
	Line Declarations.	227
	DCP Declaration.	228
	RJE NDLII DEFINITIONS: B 6900 SYSTEM	229
	Editor and Algorithm	229
	Class Declaration.	229

Terminal Declarations.	229
Station Declarations	230
Line Declaration	232
Hardware Definition (NSP/LSP).	233

UNDERSTANDING RAILROAD DIAGRAMS	235
---	-----

GLOSSARY.	245
-------------------	-----

INDEX	263
-----------------	-----



1 INTRODUCTION

GENERAL DESCRIPTION

A Remote Job Entry (RJE) system enables distant locations to input data to a central data processing system and receive the required output. This is accomplished mainly through the use of high-speed transmission lines and small terminal processors at the remote location.

The Burroughs A Series RJE system provides routing and control capabilities that ensure the proper input of data to the main system and the proper output of data to the correct originator.

The term "A Series systems" used in this manual refers to the Burroughs A Series and B 5000/B 6000/B 7000 Series computers. However, in cases where the product is machine-specific (for example, B 6800 system only), the appropriate system designation is used.

SCOPE OF THIS MANUAL

This manual presents RJE capabilities information for existing A Series systems. The manual has been designed to provide information both for users of the RJE Message Control System (MCS) and for system programmers responsible for tailoring and maintaining RJE for particular installations. Thus, the material in this manual varies in its level of complexity and in its presumptions about the knowledge of the reader.

In particular, the following descriptions of RJE messages are primarily for RJE users:

- Input messages (in the "RJE Input Messages" section)
- Control messages (in the "RJE Control Messages" section)
- Sample RJE sessions (in the appendix titled "Sample RJE Sessions")
- RJE-related Operator Display Terminal (ODT) messages (in the appendix titled "ODT Input Messages")

RJE REFERENCE MANUAL

The following descriptions are primarily for programmers responsible for maintaining RJE:

- Design description (in the "Overview" section)
- User and Master Control Program (MCP) interfaces to RJE (in the "User Interface" and "MCP Interface" sections, respectively)
- Sample Network Definition Language (NDL) and Network Definition Language II (NDLII) declarations for RJE (in the appendix titled "System Input Messages")

STRUCTURE OF THIS MANUAL

Sections

1 INTRODUCTION

The manual's content, organization, and syntax notation are discussed.

2 OVERVIEW

RJE concepts, design, line discipline, and the functional interface between the remote computer, Network Definition Language (NDL), Data Communications Controller (DCC), and RJE are discussed.

3 USER INTERFACE

User interfaces with RJE, security conventions, RJE log-on and log-off, remote decks, Remote Supervisory Console (RSC) terminals, types of input/output messages, backup file handling, file transfer, terminal transfer, and Halt/Load restarts are described.

4 RJE INPUT MESSAGES

A list of RJE input messages, including syntax, is presented.

5 RJE CONTROL MESSAGES

A list of RJE control messages, including syntax, is presented.

6 MCP INTERFACE

A summary description of the interface between the RJE system and the MCP is presented. Brief explanations of RJE task attributes, Work Flow Language (WFL) statements, ODT messages, job decks, and backup and internal interface messages are given.

7 RJE COMPILATION

A list of special RJE compile-time options and source defines, and a sample job deck for compiling RJE are provided.

Appendixes

A SAMPLE RJE SESSIONS

Examples of RJE sessions are presented.

B ODT INPUT MESSAGES

A summary of valid ODT messages for use with RJE is presented.

C NDL/NDLII DEFINITIONS

A few examples of NDL and NDLII definitions for RJE are presented.

In addition, an explanation of railroad diagrams and a glossary appear at the end of this manual.

RJE REFERENCE MANUAL

RELATED DOCUMENTS

Document -----	Form No. -----
CANDE Reference Manual	1169869
DCALGOL Reference Manual	5014574
Network Definition Language (NDL) Reference Manual	1176690
Network Definition Language II (NDLII) Reference Manual	1169604
Operator Display Terminal (ODT) Reference Manual	1169612
System Software Site Management Reference Manual	1170008
System Software Support Reference Manual	1170016
System Software Utilities Reference Manual	1170024
Work Flow Language (WFL) Reference Manual	1169802

2 OVERVIEW

BASIC CONCEPTS

The RJE concept involves a system that consists of a remote satellite system or station connected to a central system through a communications line. Peripheral devices such as card readers or line printers are connected to the remote satellite system. A configuration for an RJE system is shown in Figure 2-1.

An RJE system allows the following activities:

- Introducing complete jobs from a remote card reader for processing by the central system
- Introducing data from a remote card reader for processing by programs that are resident in the central system
- Outputting data produced by the central system to the remote peripherals
- Monitoring and controlling programs on the central system through a Remote Supervisory Console (RSC)

A Message Control System (MCS) titled "SYSTEM/RJE" is available for implementing RJE capabilities on A Series systems. In addition to the functions described previously, this MCS can handle communications between two central systems. File transfers from one system to the other are allowed; also, terminal transfers between hosts are possible. For example, if a terminal or station on one system is connected to an MCS and/or programs on another host through RJE, the transfer station appears local to the remotely connected host.

RJE REFERENCE MANUAL

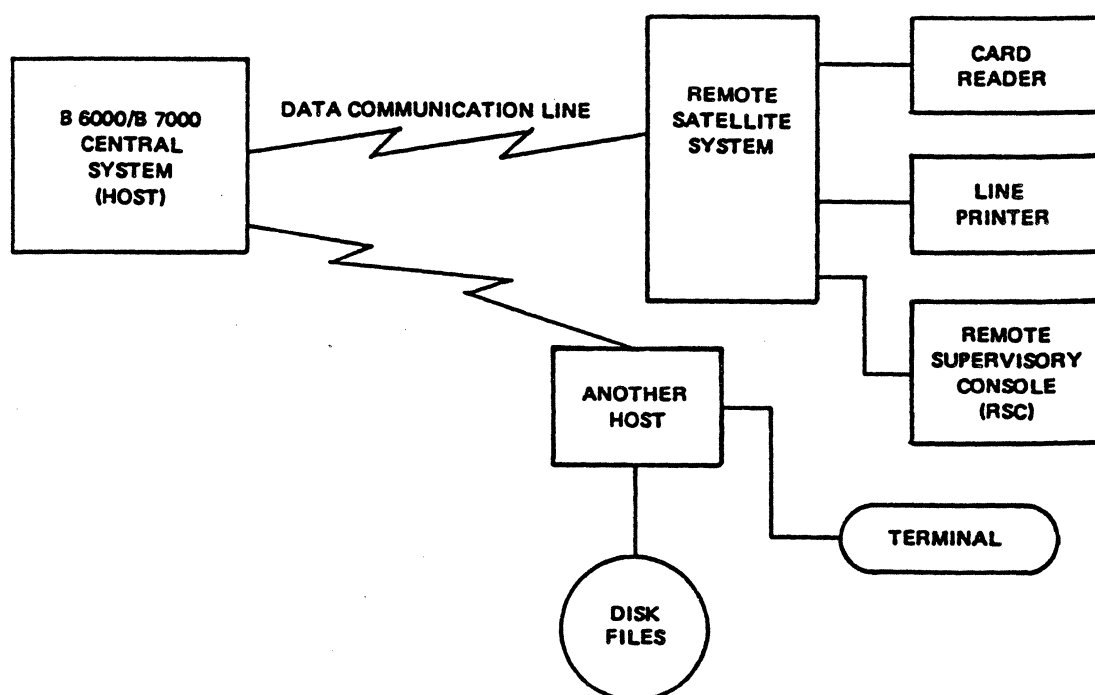


FIGURE 2-1. TYPICAL RJE SYSTEM

DESIGN CONSIDERATIONS

An efficient RJE system design hinges on two primary considerations: the communications line interface and the functional interfaces between the various components of the system. This subsection discusses these two important design considerations as they apply to the Burroughs A Series RJE system.

Communications Line Interface

The data communications (datacomm) line interface or line protocol provides the link between a remote terminal and the central system. The design of this important link should take the following into consideration:

- Maximum throughput of the line
- Error detection and recovery from line errors

Some factors that influence line throughput are discussed in the following paragraphs.

Line Turnaround per Message

Reducing line turnaround per message can enhance line throughput. However, the reduction must not occur at the expense of error detection and recovery.

Message Blocking

Sending multiple records per message can also enhance line throughput. However, the messages should not be large enough to cause excessive retransmission because of line errors.

Field Compression/Expansion Techniques

Several techniques can be used to reduce the transmission time of certain fields of data, for example, sending three characters to represent a field of several adjacent blank characters. This technique reduces the line time required to transmit long strings of repetitious data.

Directional Enhancement

Sending messages in one direction while error recovery proceeds in the opposite direction enhances line throughput.

In addition, error recovery and retry capabilities must be implemented for the following conditions:

1. Line collision. This condition results when both ends of the communications line attempt to transmit at the same time with a contention-mode line routine or a polled-mode line routine during recovery cycles.
2. Loss of messages. This condition results when modems fail to operate synchronously with the computer site. This condition results in a time-out on receive.
3. Reception of partial messages. This condition occurs when modems drop out of synchronous operation in the middle of a message. This condition results in vertical or horizontal parity errors or in carrier frequency loss.
4. Reception of garbled messages. This condition is caused by the reception of erroneous bit patterns in such a way that the line control characters cannot be recognized. This condition results in vertical and horizontal parity errors.
5. Noise patterns. Electrical interference can cause noise patterns on the line to be detected as garbled messages.

Line Interface Implementation

The following paragraphs describe the A Series systems implementation of the RJE line protocol.

Line Routine

Figure 2-2 illustrates the basic line configuration without recovery aspects for the A Series RJE system. The line routine employed is a contention-mode routine. Contention-mode is illustrated because polling is not an overhead problem for the A Series systems, although it can be for the remote satellite.

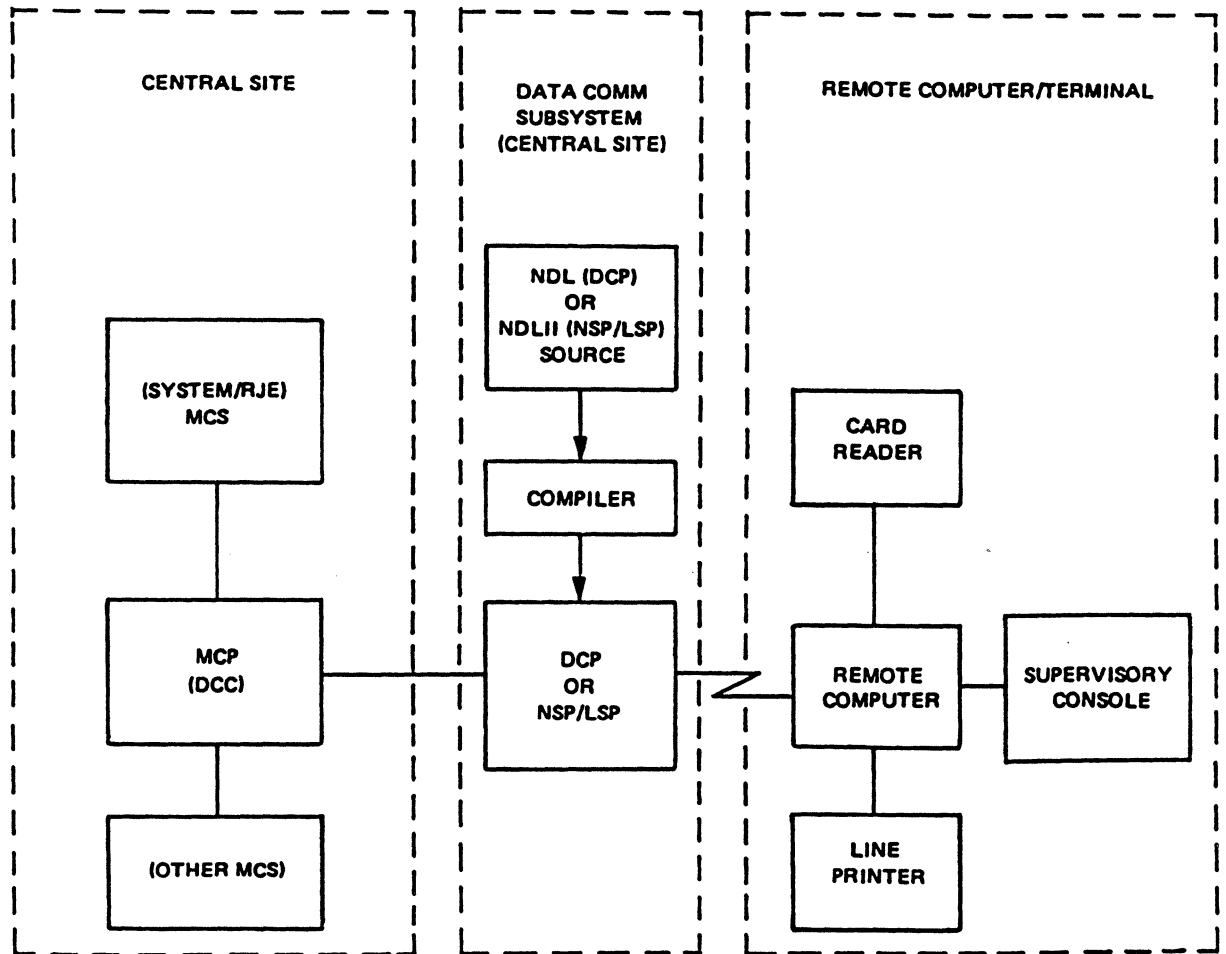


FIGURE 2-2. RJE SYSTEM LINE CONFIGURATION

The line routine has the following features:

1. If the receiver has a message, the message is sent as an acknowledgement, thus reducing line turnarounds per message.
2. If the receiver does not have a message, an ACK message is sent as the acknowledgement, thus minimizing the length of time the line is tied up.
3. If a remote input/output (I/O) device (card reader or line printer) is not ready, the device does not tie up the remaining remote stations.

A line routine with error detection and recovery is illustrated in Figure 2-3. The line routine, including the error detection and recovery aspects, is further expanded by the use of flags that establish communications between the Network Definition Language (NDL) transmit and receive requests and record the sequence of line routine operations. The use of the various characters illustrated in the line discipline is described under "Message Format" in this section.

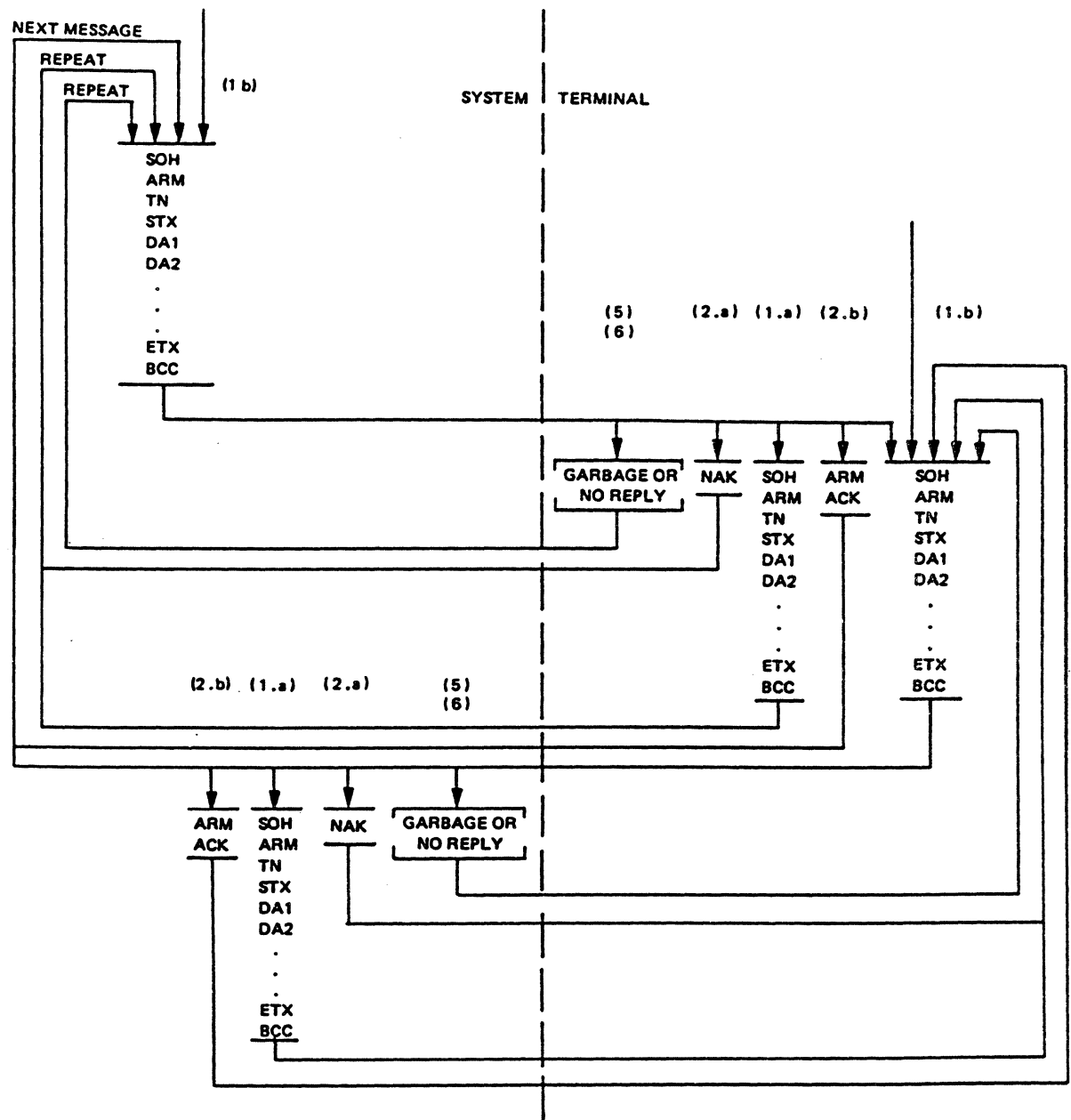


FIGURE 2-3. FLOW OF RJE LINE DISCIPLINE

Notes for Figure 2-3

The following notes refer to Figure 2-3. The parenthesized numbers in Figure 2-3 relate portions of the diagram to the following paragraphs.

In these notes, the terms "system" and "terminal" can be interchanged without destroying the accuracy of the text. In the following discussion, the system transmits a message to the terminal and expects a response from the terminal in response to the transmission.

1. If the receiving terminal has data to transmit to the system after receiving a message from the system, the terminal acknowledges receipt of the message positively or negatively, as described in the following paragraphs:

- a. Negative acknowledgement

The message received contained parity errors or was in an invalid format. As a result, the TN (transmission number) character from the last valid message received is returned in the ARM (acknowledgement received message) field of the message transmitted to the system.

- b. Positive acknowledgement

The message received was valid, and the TN character from the received message is returned in the ARM field of the message transmitted to the system.

2. If the terminal has no data to transmit to the system after receiving a message from the system, the terminal acknowledges the receipt of the message positively or negatively, as described in the following paragraphs:

- a. Negative acknowledgement (NAK)

The message received was invalid; as a result, a single ASCII NAK control character is transmitted to the system.

- b. Positive acknowledgement (ACK)

The message received was valid, and a two-character message consisting of the TN character from the received message followed by an ASCII ACK control character is transmitted to the system.

Overview

The system responds to the acknowledgement messages from the terminal in the following manner:

3. If a NAK character is received from the terminal (case 2a) or if the terminal response is a message containing text (case 1a) with an ARM character that does not match the last TN character sent, then the system retransmits the last message sent without changing the TN character. Data can still be received from the terminal. The system positively or negatively acknowledges response messages by appropriately setting the ARM character of the retransmitted message to the TN character of the last valid message received from the terminal.
4. If the ARM field of the message received from the terminal matches the TN character of the last transmitted message (cases 1b and 2b), the system must increment the TN character stored and transmit the next message to the terminal.
5. If the system cannot recognize the response from the terminal, the system assumes that a negative acknowledgement has been received. This assumption causes a retransmission of the last message sent without any change in the the TN character. If the terminal has been trying to positively acknowledge the last message received, the terminal ignores the retransmitted message and issues an acknowledgement.
6. If the terminal does not respond within a one-second time-out period to the last message sent by the system, the system retransmits the message without changing the TN character. Thus, the cycle reverts to step 1 in Figure 2-3.

Message Format

The message format is consistent with the goals of maximizing line throughput and detecting and recovering from errors. The format of a message in ASCII-67 is illustrated in Figure 2-4.

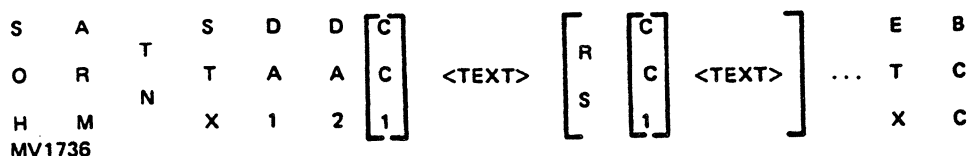


FIGURE 2-4. MESSAGE FORMAT: ASCII-67

Notes for Figure 2-4

Each column of capital letters indicates a single character. Brackets ([]) indicate an optional element that is discussed in the following paragraphs; three dots (...) indicate repetitions of the preceding optional element.

"SOH" is the standard ASCII SOH character (01), which indicates that data is being transmitted.

The ARM character indicates positive or negative acknowledgement of the previous message received. ARM is initialized to a NUL character during the establishment phase of the routine. When an ARM sequence (SOH-ARM) is received, it is compared with the last transmission number sent. If the ARM character agrees with that TN, the last message sent was positively acknowledged. If the characters do not agree, the previously sent message is negatively acknowledged and is retransmitted. When a valid text message is received, the transmission number contained in that message is stored for use as the next ARM character transmitted.

Overview

"TN" is considered the "transmission number" portion of the message and is used to positively or negatively acknowledge a message. Each end of the datacomm line uses only two alternating characters as transmission numbers. The transmission numbers selected for remote terminals are "F" and "U". The lowercase characters "f" and "u" are used by the Data Communications Processor (DCP). Refer to the preceding discussion of ARM.

"STX" is the standard ASCII STX (02) character, which serves as the delimiter between the preceding header portion and the text portion of a message.

DA1 and DA2 are two "device address" characters that associate a message with a particular remote device on an RJE terminal. These characters are used by the remote computer to route data to the remote device and are inserted in messages containing data transmitted from these devices. The addressing convention for the use of these characters is shown on the following page.

DA1/DA2 Device Designation

DA1 ---	DA2 ---	Remote Device -----
0	0	System control
0	1	To or from a Remote Supervisory Console (RSC)
0	2	To a card punch (CP); from a card reader (CR)
0	3	To a line printer (LP); "from" is an error
0	4	To a file transfer link
0	5 - 8	(Reserved for future expansion)
0	9	Terminal transfer pseudo-stations
1 - 9		(Reserved for future expansion)

The CCl (carriage control) character is used only for a remote output device such as a line printer. Refer to the preceding paragraph regarding DA1 and DA2.

The CCl character indicates that carriage control is to be performed by the remote computer according to the conventions in the following list.

RJE REFERENCE MANUAL

CC1	Meaning
---	-----
0	Print; do not space
1	Print and single-space
2	Print and double-space
A	Print and skip to channel 1 (top of page)
B	Print and skip to channel 2
C	Print and skip to channel 3
D	Print and skip to channel 4
E	Print and skip to channel 5
F	Print and skip to channel 6
G	Print and skip to channel 7
H	Print and skip to channel 8
I	Print and skip to channel 9
J	Print and skip to channel 10
K	Print and skip to channel 11
L	Print and skip to channel 12 (end of page)

The RS character is the standard ASCII RS character (1E) that separates records within a single message. Two adjacent RS characters or two RS characters separated by a CC1 character (if the device is a line printer) indicate a blank record.

The ETX character is the standard ASCII ETX (03) character that indicates the end of the text of a message.

The BCC character (block check character) is the longitudinal parity character of the message, which represents the "exclusive-or" of all characters in the message following the SOH character up to, and including, the ETX character. The BCC character ensures proper reception of messages. Messages containing incorrect BCC characters are negatively acknowledged.

The line routine suppresses the transmission of long strings of blank characters by using the ASCII control character, ESC(27), followed by two characters representing a two-digit decimal number to replace a string of blanks whose length is given by that decimal number. Consecutive repetitions of this ESC convention are used to represent strings of more than 100 blanks. For example, "ESC 9 9 ESC 0 5" appearing in the text portion of a message represents 104 consecutive blank characters.

Functional Interface

The following subsection provides a brief description of each element of an A Series RJE system and of the interfaces among these elements.

Remote Computer

The remote computer is a small terminal computer to which an 80-column or 96-column card reader, a line printer (120 characters minimum), a 72-character supervisory console, and optionally, an 80-column or 96-column card punch can be connected. This group of remote devices can be viewed from the main system as a group of remote stations on a single datacomm line that are controlled by the RJE MCS.

If the remote computer is another host, communication between the two hosts allows only disk file transfers and terminal transfers (connection of a terminal of one host to the other host in the RJE MCS). The remote host can be a B 1000 Series system, a B 2000/B 3000/B 4000 Series system, a B 5000/B 6000/B 7000 Series system, or an A Series system.

NDL and DCP (B 6700/B 6800)

Certain requirements must be stated in an NDL definition to establish an RJE system. First, the RJE MCS must be specified as the controlling MCS. Second, the user must specify in the NDL how the remote computer is connected to the system, including:

1. Definition of the pertinent data set characteristics
2. Physical attributes of the remote computer
3. Logical attributes of the user station
4. Physical attributes of the connecting line

NOTE

For examples of RJE terminal definitions, refer to the released SYMBOL/SOURCENDL file.

NDLII and NSP/LSP (B 6900/B 5900)

Certain requirements must be stated in a Network Definition Language II (NDLII) definition to establish an RJE system. First, the RJE MCS (SYSTEM/RJE) must be specified as the controlling MCS. Second, the user must specify in the NDLII how the remote computer is connected to the system, including:

1. Algorithm and editor used
2. Physical attributes of the remote computer
3. Logical attributes of the user station
4. Physical attributes of the connecting line

NOTE

For examples of RJE terminal definitions, refer to the released SYMBOL/SOURCENDLII file.

Datacomm Controller (DCC)

The Datacomm Controller (DCC) is a set of Master Control Program (MCP) procedures that controls the interface between the datacomm subsystem (DCP or NSP/LSP) and the central system. The DCC performs the following functions:

1. Activates the controlling MCS for a station when the station first becomes active
2. Transfers messages between the datacomm subsystem and the central system
3. Ensures that network control instructions executed by the MCS are in the correct formats and sequences
4. Informs the MCS of exception conditions that occur on stations attached to the controlling MCS

Overview

RJE MCS

The RJE MCS coordinates activity at the remote terminal in the following ways:

1. RJE establishes security requirements that require the remote user to initiate activity at the main system in the same way that the user logs on at the remote terminal.
2. The RJE MCS interfaces between the user input statements at the RSC or terminal and the MCP that services these input statements as ODT input messages. RJE handles job decks read from the remote card reader and sends copies of the job decks to the Work Flow Language (WFL) compiler, which either rejects the decks as syntactically incorrect or accepts them and locks job files that cause the job to be executed at the main system. The jobs can also be compiled for syntax in the same way as at the main site. The MCS then handles system output messages that are directed to the remote user by the MCP.
3. RJE then handles the output of backup files produced by jobs initiated by the remote user by printing or punching these jobs at the remote terminal.



3 USER INTERFACE

INITIALIZATION

RJE can be initialized explicitly by the operator, using the Work Flow Language (WFL) RUN SYSTEM/RJE statement, or automatically by the Datacomm Controller (DCC) when the DCC detects activity in a station associated with the RJE Master Control System (MCS).

RJE protects itself from accidental discontinues by performing a "lock program" request during initialization. This request causes any Operator Display Terminal (ODT) request that would discontinue RJE to return the response "PROGRAM IS LOCKED". The "<mix number> SM QUIT" command should always be used to cause RJE to go to end-of-job (EOJ). If RJE must be discontinued, the program can be unlocked using the "<mix number> LP-" ODT command. Refer to "SM" in the "RJE Control Messages" section.

SECURITY CONVENTIONS

A remote user can select names for files and, at the same time, address site files regardless of the use of those file names by other remote users. However, all file names must be unique if the main site is to perform library maintenance on all types of files.

To allow remote users to be isolated from each other so far as file name selection is concerned and, at the same time, to maintain a system of unique names for the central system, the data processing manager can assign user identification to each user of the system. The RJE MCS obtains this user identification either by station log-on or by a user control card.

RJE LOG-ON/LOG-OFF

The activation of an RJE terminal is called the log-on procedure. Users can log on by supplying the RJE MCS with a valid usercode and password combination or by initiating activity at the Remote Supervisory Console (RSC) using the NOLOGON compile-time option or the LOGON run-time option.

RJE REFERENCE MANUAL

The NOLOGON compile-time option is described under "RJE Compile-Time Options" in the "RJE Compilation" section. The LOGON run-time option is described under "*SO" in the "RJE Input Messages" section. Log-on and log-off messages in this section contain information on how the RJE MCS must be supplied with the user identification.

The usercode obtained from the log-on procedure, if any, is the default usercode associated with job decks read from the remote reader and keyins such as PD (Print Directory) entered from the RSC. Any user control cards contained in the job decks override this default usercode for the tasks involved.

REMOTE DECKS

Decks acceptable to the RJE card reader are the same as decks acceptable to the central site, except that binary card decks are not allowed.

A discussion of card decks acceptable to RJE is contained in the "Work Flow Language (WFL) Reference Manual."

The RJE MCS does not examine the contents of remote card decks. Instead, RJE processes a copy of the WFL compiler to perform this function and to generate job files for syntactically correct decks. Such RJE tasks are given the name "WFLCOMPILER[<LSN>]": a different copy of this WFL task is provided to service each remote reader under RJE control, and communication with these tasks is handled internally by the queue mechanism. The WFL compiler task is activated when a card is read at the remote reader and goes to EOT (end-of-task) when a job file is locked and no further cards have been read in (that is, when an END or END JOB statement terminating a job deck is encountered) or when the remote user enters "*CL CR" at the RSC. Refer to the "RJE Input Messages" section.

All decks are read in EBCDIC; the WFL compiler performs translation to Burroughs Common Language (BCL) as required.

User Interface

REMOTE SUPERVISORY CONSOLE (RSC)

A remote operator/system interface is required to make decisions that cannot be preprogrammed. This interface is provided through messages that are output and input at the RSC.

Non-RJE terminals (those having an NDL TERMINALTYPE identifier that does not start with the letters "RJE", such as TD800s and TELETYPES, can be connected to the RJE MCS. These terminals have usually been released to RJE from another MCS and do not belong to an RJE family of stations (PROCESSOR, RSC, CARDREADER, LINEPRINTER, or FTS).

When a non-RJE terminal is released to RJE, any log-on checks, station-id checks, or both required by RJE are performed. After a successful log on, the terminal responds in the same way as an RSC of any RJE family of terminals, including all restrictions placed on the terminal "SYSTEM/SCTABLEGEN".

All RJE "*" commands are valid, and access to WFL through CONTROLCARD is allowed. The *RE or BYE command is required to return the terminal to the original MCS. In subsequent discussions in this manual, non-RJE terminals released to RJE are considered to be RSCs.

OUTPUT MESSAGES

The four basic types of RSC output messages are local, log-on and log-off, RJE output, and system output messages. The following subsections discuss these message types.

Local Messages

Messages generated by the remote computer pertain to its own control and error handling; examples of these messages are "READER HOPPER EMPTY", "PRINTER OUT-OF-PAPER", and "MODEM TRANSMISSION ERROR". The formats of these messages depend on the type of RJE remote computer used.

Log-on and Log-off Messages

The following procedure must be used to employ RJE in a secured-terminal environment, in which every user of an RJE terminal is required to supply the MCS with an acceptable usercode and password, and possibly, with an accesscode and/or a chargecode.

In this discussion, the remote computer is assumed to be a B 776. First, a valid usercode must be recorded in the SYSTEM/USERDATAFILE resident in the main system. If an accesscode is required for that usercode, the ACCESSCODENEED indicator for the usercode should be set in the USERDATAFILE. If a chargecode is required for that usercode, the CHARGEREQ indicator for the usercode should be set in the USERDATAFILE.

Next, after establishing contact between the RJE terminal and the datacomm subsystem (for example, by dialing in), the RJE operator enters "HELLO" at the RSC. This HELLO message is a "handshake" message to the RJE MCS, and any other keyin is interpreted as a usercode.

If the central system or datacomm line is not operating, the RJE terminal displays the following message at the RSC after a brief delay:

.MDM-RETRY ERR

If a connection exists, RJE displays the following messages at the RSC:

B6700 SYSTEM/RJE SYSTEM#<system id> HOSTNAME = <system host name>
<version number>

MIX=<MCS mix number>

#USERCODE?

User Interface

The syntax for logging on is as follows:

```
--<usercode/password>-----|
                        |
                        |-<chargecode specification>-|
```

<chargecode specification>

```
-- : --- CHARGE -----<chargecode>--|
      |           | |      |
      |- CHARGECODE -| |- = -|
```

The RJE operator can then enter the usercode and password on the same line, separated by a slash (/) or a blank space. A chargecode might also be required. If the usercode or password is not supplied, RJE displays the prompt:

ENTER USERCODE PLEASE.

or

ENTER PASSWORD PLEASE.

If no password is designated, a period is placed after the usercode. For remote terminals that use the period as a control character (for example, B 700 Series machines), the RJE "NOPASSWORD" command can be used to allow running without specifying a password. If the usercode or password is invalid, RJE responds with the following RSC message:

#SECURITY ERROR, ENTER USERCODE.

The usercode and password pair must then be re-entered.

If an accesscode is required for all users because RJE was compiled with ACCESSDEFAULT set because the RJE control message "SO ACCESSCODE" was used, or because the ACCESSCODENEED indicator was set for that user in the USERDATAFILE, then RJE displays the prompt "ACCESSCODE?". Refer to "RJE Compile-Time Options" in the "RJE Compilation" section and to "SO" in the "RJE Control Messages" section.

RJE REFERENCE MANUAL

After an accesscode is entered, RJE displays the following message:

AND YOUR ACCESSCODE PASSWORD

A period can be entered if the accesscode has no password.

The accesscode and password are validated in the USERDATAFILE. If valid, the accesscode and password are applied to all jobs entered at the RSC unless an explicit accesscode or usercode specification appears in the job input. If the accesscode and password are not valid, RJE responds with the following prompt:

INVALID ACCESSCODE/PASSWORD, ENTER ACCESSCODE

RJE is not logged on until a valid accesscode and password have been entered. If HELLO is entered, RJE aborts the log-on attempt and asks for the usercode again.

If RJE does not require log on and no default usercode is assigned, no default accesscode can be assigned.

RJE records accesscodes at the beginning and end of session messages.

If RJE is logged on with a default usercode, the RJE "**ACCESS" command can be used to change the accesscode, to add the accesscode if no accesscode is present, or to delete the accesscode. Refer to "**ACCESS" in the "RJE Input Messages" section.

After the user identification and accesscode, if requested, are found to be valid, RJE displays the following RSC message:

<RJE station name> LOGGED ON AT <time> <date>
SESSION <session number>.

User Interface

The RJE user can then proceed with job introduction and RSC activity. If user identification is not required for log on, the MCS does not ask for the operator's usercode but issues the logged-on message immediately after RJE identifies itself.

NOTE

LOGONCHECK is used to validate log-on attempts, chargecode changes, and accesscode changes; it can also be used to examine security violations. Violations detected by LOGONCHECK are displayed at RJE stations. The display indicates whether LOGONCHECK is going to clear, save, or disconnect the station at which the violation has occurred.

If the LOGONCHECK entry point to the SECURITYSUPPORT library is enabled, the following message is displayed:

```
#WILL USE LOGONCHECK ENTRY POINT  
IN SECURITY SUPPORT LIBRARY
```

If the chargecode is required and not specified after the usercode/password, the user receives the following message:

```
#ENTER CHARGECODE PLEASE
```

If an invalid or syntactically incorrect chargecode is entered, the usercode/password must be re-entered.

If the STATIONID run-time option is used, entry of a valid station name is a required part of the log-on sequence. Refer to "STATIONID" under "**SO" in the "RJE Input Messages" section.

The MCS notifies the newly logged-on terminal of any pending printer or punch backup files. Printing or punching starts automatically if the AUTOBACKUP terminal option is set.

The remote operator enters "BYE" or "**BYE" to terminate a session at an RJE terminal.

RJE Output Messages

The RJE MCS presently issues two types of RSC output messages: RJE status messages and messages issued in response to RJE input messages.

RJE status messages include the "card reader not ready" message and run-time messages resulting from central operator activity. The card reader message has the form "#CR NOT READY." and indicates that the copy of the WFL compiler processed by RJE to service this card reader has not yet gone to EOT and that an unacceptable amount of time has passed since RJE has received card input from the remote reader.

The card reader message usually indicates one of two things: either the job deck just read in did not end with an appropriate END or END JOB control card, or the combination of a slow card reader and line errors slowed the rate at which RJE was sent blocks of card images. The card reader can be cleared by either using the RJE "*CL" (CLEAR) input message which discards the cards already read in, or reading in the remainder of the job deck.

The RJE messages issued in response to central operator activity include text directed to a terminal by the system operator, notices that indicate the system operator has changed the run-time RJE environment, and notices that RJE has been forced out of the job mix. These messages are preceded by a "#".

The RSC messages issued by the MCS in response to RJE keyins are discussed for each individual command in the "RJE Input Messages" section.

System Output Messages

All other messages displayed at the RSC are generated by the MCP. These messages have formats identical to those displayed at the main system and include RSVPs, displays, task status messages, and replies generated in response to system input messages entered at the RSC. Refer to "ODT Input Messages" in this section.

User Interface

INPUT MESSAGES

The three basic types of RSC input messages are RJE input messages, RJE control messages, and ODT input messages. The following subsections discuss these message types.

RJE Input Messages

The RJE MCS provides an interface between the RJE user and the MCP that services the user's RSC keyins. Complete transparency of this interface is impossible because many RSC keyins must be provided to communicate directly with the MCS; therefore, any RSC input message beginning with the character "*" is handled directly by RJE. These RJE input messages provide control over the following areas of MCS activity:

- Session log off
- MCS debugging aids
- AUTOBACKUP routine activity
- States of RJE terminal run-time options
- Datacomm reconfiguration
- Interterminal communication
- MCS environment interrogation

A complete list of RSC keyin statements including a detailed discussion of each statement is contained in the "RJE Input Messages" section.

RJE Control Messages

The activity of the RJE MCS can be interrogated or controlled with control messages. These messages are preceded by "SM" and can be entered through the main system operator console using the "<RJE mix#> SM ODT" message or through an RSC terminal (either an RJE RSC or an independent station) using the *SM message if that terminal is allowed to do so (that is, if the station is defined in NDL with SPO = TRUE or if the RSC or RJE "SPO" control message is used).

Refer to "RSC" and "SPO" in the "RJE Control Messages" section and to "RJE Compile-Time Options" in the "RJE Compilation" section. A complete list of RJE control messages including a detailed discussion of each statement is presented in the "RJE Control Messages" section.

ODT Input Messages

All RSC input messages not prefixed by an asterisk or the control character of the remote site are sent to the Master Control Program (MCP) in the form in which they are keyed in. The MCP then generates appropriate responses, which are issued to the RSC where the input message was keyed in.

The RSC is designed to resemble the main system ODT as closely as possible. However, security restrictions impose certain constraints on RSC keyins. For example, the usercode under which the session is active is imposed on the PD (Print Directory) input message so that only the user's own usercode directory can be interrogated. Also, certain keyins such as those that alter main system options or purge or clear main system peripherals are disallowed when entered at an RSC.

The legal ODT input messages are indicated in SCTABLEGEN, and the imposed constraints can be altered by altering SYMBOL/SCTABLEGEN (the input to SYSTEM/SCTABLEGEN). The output of SYSTEM/SCTABLEGEN is a patch file for the CONTROLLER (used in the MCP compilation). Refer to "SPO REQUESTS" and to "Software Compilation" in the "System Software Site Management Reference Manual."

WFL statements can be entered at an RSC in the same way as at a main system ODT. Mix-related ODT input messages can refer only to jobs initiated by the terminal at which the BEGIN is entered.

The following ODT messages are available mainly for inquiry to the RJE user: A, AX, C, CU, DBS, DS, DUMP, FA, FR, HI, IB, J, LOG, MM, MSG, MX, NS, OF, OK, OL, OT, PD, PER, PF, PR, PV, QF, QT, RM, S, SM, SP, SQ, SS, ST, SUPPRESS, TD, TERM, TF, THAN, TI, W, WM, and WY.

Only the interrogative forms of the following ODT messages are legal: CS, DQ, FORM, HN, ID, LL, ML, NET, OP, SB, SC, SI, SL, and UQ.

The following non-mix keyins are legal: LOG, MM, OL, PC, PD, PER (or P), PI, QF, SP, SQ, SS, TF, TO, WD, WI, WM, WS, and WT.

Only the interrogative forms of the following keyins are legal: CF, CM, DC, DM, DQ, FORM, LL, MIXL, RO, SB, SO, and UQ.

The appendix titled "ODT Input Messages" contains summary descriptions of ODT messages that are legal for RJE.

User Interface

ODT input messages and WFL statements cannot be entered at a terminal that has been transferred with a *CT command; the input is rejected with the message "#INV KEYIN".

BACKUP FILE HANDLING

Backup files generated by RJE-initiated jobs are placed in directories separate from those employed at the main system. All printer backup is placed in the "REMLP<MCS number>" directory, and all punch backup is placed in the "RE MCP<MCS number>" directory. For example, if task 1235 of job 1234 initiated by an RJE terminal generates a printer file with the name "LINE", and RJE has the MCS number 2 assigned by default in the NDL software, then that printer file is on disk with the following title:

REMLP02/0001234/0001235/000LINE

When job 1234 goes to end-of-job (EOJ) and the "AUTOBACKUP" terminal option of the RJE terminal that initiated the job is set, then the AUTOBACKUP routine of RJE is processed to output backup for this job. If the terminal has logical station number (LSN) 38, this task has the following name:

AUTOPRINT/LSN038/#1234.

If a FORMMESSAGE is associated with the backup file, RJE associates a printer with this FORMMESSAGE. The task outputs the printer file at the remote printer after the execution summary of the job has been printed and along with the other printer files generated by the tasks of the job that are destined for the originating terminal. Messages indicating the removal of these backup files are issued at the RSC by the MCP as the files are output.

RJE searches DISK, PACK, and the DLBACKUP families for REMLP and REMCP files. Refer to "*SB" in the "RJE Input Messages" section. The location of the DLBACKUP is tested only at RJE beginning-of-job (BOJ) and is used only if it points to a family other than DISK or PACK. If DLBACKUP is changed to a family other than DISK or PACK with RJE active, then RJE does not find any REMLP file created on the new family.

The REMLP files can be found only by issuing a QUIT to RJE and reinitializing with the correct DLBACKUP. This procedure causes RJE to rebuild its print queues from DISK, PACK, and the new DLBACKUP family. RJE does not find any files on the old DLBACKUP family (if the family is not DISK or PACK) that have not been printed.

If a task running under SYSTEM/CANDE directs a printer file to an RJE printer (refer to "DESTNAME" in the "MCP Interface" section), the pound sign (#) is replaced by a "C" in the job number of the AUTOPRINT or AUTOPUNCH routines (for example, "AUTOPRINT/LSN038/C1234").

HOST-TO-HOST COMMUNICATION

The RJE MCS can be used to perform certain operations between an A Series system and another host (another A Series system, or a B 1000/B 2000/B 3000/B 4000 Series system). Two special operations are available: file transfer and terminal transfer. For two hosts to have these capabilities, a hardware link must exist between the two hosts, and certain Network Definition Language/Network Definition Language II (NDL/NDLII) specifications must be met. These requirements are explained under "File Transfer" and "Terminal Transfer" in this section.

File Transfer

SYSTEM/RJE allows files to be transferred between two host systems or between a host system and a terminal. Files are transferred through a station added to a site's NDL for each RJE station family. This new station has a device address of "04" but no other special attributes. An example of this new station can be found in the "3.2 SYMBOL/SOURCENDL" file; refer also to the appendix titled "NDL/NDLII Definitions."

Because file transfer is symmetric, it can be invoked between any two systems without regard to "host" status as opposed to "terminal" status; thus, the term "host" is used in the remainder of this manual. The two classes of connection between hosts are "peer" and "nonpeer." A peer host is a system of the same software type; for example, B 6700, B 6800, and B 7700 are peers, but a B 1800 connected to a B 6800 is a non-peer. In the remainder of this manual, a peer host refers to two A Series system hosts.

File transfer is supported for disk and pack files with the following restrictions:

1. Only code and 8-bit data files (including text files) can be transferred.
2. Only one file at a time can be transferred in each direction.
3. File titles cannot be longer than 100 characters.
4. The following restriction applies only to non-peer connections. To support code file (and, in some cases, data file) transfers,

RJE must scan every record looking for characters outside of the "valid character" set. When a record with an invalid character is found, the entire record is translated into a new form that is twice the original length, but contains only valid characters. If this new record length or the original record length (MAXRECSIZE) is larger than the allowed file-transfer BLOCKSIZE, the transfer is terminated.

A file transfer is initiated by entering an RJE "COPY" control message (refer to "COPY" in the "RJE Control Messages" section) on the terminal (if permitted) or at the host ODT. This command specifies the source and destination hosts and file titles.

The hosts are specified using the respective host names. In the case of an A Series system host (for example, a B 6800, B 6900, or B 7700 system), if the ODT "HN" command has not been used, then SYSTEM/RJE creates a host name at run time. This host name is the letter "B" followed by the four-digit system model number (6900, 6800, and so forth) and the three- or four-digit system serial number. Sites that have specified a host name using the ODT "HN" command use the specified host name. If two sites are connected to a host with the same host name, requests to transfer files cannot produce the desired results.

The actual transfer of a file is initiated by the exchange of control information between the hosts. If the specified source host is the user's local host, the transfer is a "put"; if the source host is the remote host, then the transfer is a "fetch." Thus, if the file to be transferred from a local host to a remote host is on the local host, a copy request generates a put control message; if the file is on the remote host, the copy request generates a fetch control message.

All file transfers occur as "puts": if one host wishes to do a fetch, it sends a fetch message to the other host, causing the other host to initiate a put sequence. The put message elicits a put reply, which signals that data transfer can begin, or supplies a reason for the rejection of the put request.

If the data is transferred, the sending host then sends one or more data messages followed by an end-of-file (EOF) message to device address "04". The sending host processes a task called "FILEX[<LSN>]", where <LSN> is the LSN of the station connected to the remote host. This task, which runs independently of SYSTEM/RJE, opens the requested source file and performs any data compaction or translation required in the course of the transfer. The receiving host processes a task called "FILER[<LSN>]", which also runs independently of the destination file. When the file transfer has completed, the receiving host informs the requestor that the request has completed.

RJE REFERENCE MANUAL

NOTE

All MAXRECSIZE and BLOCKSIZE values in RJE put or fetch records are the same as if the requested file were of type CHARACTERS. When a file with UNITS EQUAL 0 (WORDS) is requested for transfer, the MAXRECSIZE and BLOCKSIZE are adjusted to the UNITS EQUAL 1 (CHARACTERS) values for transmission. If the receiving host is a B 6000/B 7000 Series system and UNITS EQUAL 0, the destination file has its MAXRECSIZE and BLOCKSIZE adjusted back to WORDS. For non-B 6000/B 7000 Series destination hosts, no record type of WORDS exists, and all files remain in CHARACTERS format.

Any file transfer requests that occur while another transfer is in progress are queued and then executed when possible. When a request is queued, the following message is displayed:

#FILE TRANSFER STATION IN USE - COPY REQUEST WILL BE QUEUED.

All requests are queued as puts; thus, if a user requests a copy that causes a fetch to be generated, the request is sent to the other host and can be queued for the reason given previously. If the COPY request is syntactically correct and passes resident and security checks, the following message is displayed:

#COPY REQUEST VALID - WILL FORWARD.

The other host responds with either an error display or a "request accepted" display; in the latter case, the transfer then starts.

All files from non-peer hosts are locked as type DATA; files from peers are locked with as many of the attributes of the original file as possible (including FILEKIND).

RJE uses CRUNCH to lock all files that are crunched on the source host.

File Transfer Abort

RJE aborts a file transfer when any of the following conditions occur:

1. Program fault in either FILEX or FILER tasks (for example, SEG ARRAY or INVALID INDEX errors).
2. Operator discontinuation of either FILEX or FILER tasks.
3. Parity error while reading the input file in FILEX.
4. The result of expanding a record because of an invalid character (nongraphic) produces a record greater than the file transfer BLOCKSIZE.
5. The file has become unavailable before the file transfer has begun.

All of these error conditions produce a message to the originator stating the reason for the abort. This error message has the following format:

```
#FT ABORT @ <host name> - <abort reason>
```

The <host name> is the hostname at the site where the abort occurred.

The <abort reason> is one of the following:

1. OPERATOR DS
2. PROG FAULT(TYPE=X, CAUSE=Y, REASON=Z)

NOTE

X, Y, and Z are fields of the HISTORY task attribute.

3. EXPANDED RECORD > FT BLOCKSIZE
4. PARITY READING REQUESTED FILE
5. FILE NOT AVAILABLE

File Transfer Security

RJE file transfer correctly handles the source and destination files with regard to security. The following restrictions are enforced:

1. A nonprivileged usercode cannot use the "*" syntax to copy nonusercode files. If this syntax is used, the following error message is displayed:

FILE MUST BE IN OWN DIRECTORY.

2. A nonprivileged usercode cannot use the "*" syntax to create a nonusercode file. If this syntax is used, the following error message is displayed:

FILE MUST BE CREATED IN OWN DIRECTORY.

3. A nonprivileged usercode can only copy other usercode files if the security of the file allows it. If the security requirements are not met, the following error message is displayed:

FILE <file name> NOT RESIDENT.

4. A nonprivileged usercode cannot create a file under a different usercode. If such an attempt is made, the following error message is displayed:

FILE MUST BE CREATED IN OWN DIRECTORY.

None of the preceding restrictions applies to privileged usercodes.

File Transfer Recovery

During a file transfer, if one or both of the hosts stops for some reason, such as a Halt/Load, RJE fault, or Data Communications Processor (DCP) failure, SYSTEM/RJE stores enough information about the transfer to restart the transfer at the point that the transfer left off. This restart is done by storing the current record counts and copy requests in the RJE linkfile (refer to RJE Halt/Load Restore in this section).

On the receiving host, the destination file is not created directly, but a temporary file is created to allow restart and recovery. This temporary file is called "FILERFILE[<LSN>]" and is created under the destination usercode unless it is a system file (a system file's name is preceded by a "*") on the destination <volume name>. When the transfer has successfully completed, the temporary file is retitled and locked.

User Interface

At initialization, RJE checks to see if any file transfers involving RJE were not completed. The following conditions must be met to continue a file transfer:

1. Connection is made to the same host on the same station (datacomm line) that was last using that station.
2. The linkfiles on both hosts are still intact and have not been removed.
3. The temporary output file on the receiving host is available.

If these conditions are met, at initialization the receiving host requests that the file transfer continue. The SEND and RECV lines displayed in response to an FTS control message have the word "RESTARTED" in parentheses for any file transfer that has been continued. Refer to "FTS" in the "RJE Control Messages" section.

If the datacomm line is to be reconnected to a different host, all queued requests and active requests are deleted and all restart information is discarded.

RJE Messages for File Transfer

A set of RJE messages and control messages is available to use and control the file transfer capabilities. The "RJE Input Messages" and "RJE Control Messages" sections contain complete syntax with explanations for these messages. A summary of these messages follows.

RJE Messages

*SF

Specifies the sizes of various buffers used by RJE. (This message is similar to the SF control message.)

*TF

Displays the RJE buffer sizes.

RJE Control Messages**COPY**

Requests initiation of a file transfer.

ABORT

Requests a file transfer to abort.

ONLINE

Initiates the connection between two hosts.

OFFLINE

Terminates the datacomm connection between two hosts.

PH

Displays, clears, changes, or retries the Automatic Calling Unit (ACU) phone number associated with the station.

SF

Specifies the characters-per-transmission blocking factor buffer of a remote printer and the maximum number of characters allowed in a file transfer block.

TF

Displays the information specified by the SF control command.

FTS

Monitors file transfer activity.

Terminal Transfer

In this manual, the terms "local host" and "remote host" have the following meanings: the local host is the system to which the terminal is physically attached; the remote host is the system where the desired application is located.

Because terminal transfer requires the use of a file transfer link, the user should be familiar with the RJE control messages ONLINE, OFFLINE, FTS, and WH (refer to the "RJE Control Messages" section). Also, some NDL conventions must be followed to use terminal transfer.

The following restrictions apply to terminal transfers:

1. A "break" cannot be sent over the System Communications Module (SYCOM) link to stop output from being generated on the remote host.
2. Unpaged Command AND Edit (CANDE) language sequence mode is not supported for transferred terminals.
3. Logical input/output (I/O) carriage control (SKIP, SPACE, STOP, and NO) is ignored.

Two types of stations must be declared in NDL to handle terminal transfer: "virtual stations" and "pseudo-stations."

Virtual Station

A virtual station must be declared in the NDL for both hosts connected to the same line as the RJE family. This family includes devices "00" (processor), "01" (RSC), "02" (card reader), and "04" (FTS). The method for conveying terminal data between hosts uses the device address fields (DA1 and DA2) of this virtual station. "DA1, DA2" in this context is termed a "virtual station address" and is used by the local and remote hosts to refer to a particular terminal. The following addressing scheme is used:

1. DA1 and DA2 are ASCII letters, one uppercase and the other lowercase.
2. If "DA1, DA2" is the transmit address for a particular terminal, then "DA2, DA1" is the receive address for that terminal.
3. When the local host refers to a terminal (by transmit address), "DA1" is a lowercase letter and "DA2" is an uppercase letter.

RJE REFERENCE MANUAL

When the remote host refers to the same terminal, because the transmit and receive roles of the terminal are reversed. "DA1" is an uppercase letter and "DA2" is a lowercase letter.

4. If a local host supports different terminals connected to a particular remote host, the local host refers to these terminals by the following virtual station addresses (as transmit addresses):

aA, bA, cA, ..., ZA, aB, bB, cB, ...

The remote host refers to the same terminals by the following virtual station addresses (also as transmit addresses):

Aa, Ab, Ac, ..., Az, Ba, Bb, Bc, ...

(These last addresses are the receive addresses of the local host.)

The local and remote hosts decide independently how many terminals each supports; thus, these numbers are likely to be different. Examples of virtual station declarations are found in the appendix titled "NDL/NDLII Definitions" and in the SYMBOL/SOURCENDL file under the RJE1 family of stations.

In the SYMBOL/SOURCENDL example, four virtual stations are declared: VSIN1RJE1 and VSIN2RJE1 (receiving stations) and VSOUT1RJE and VSOUT2RJE1 (transmitting stations used when RJE1 is acting as the local host). The number of stations and their types (input or output) determine the number of terminals that can be transferred at any time. In the RJE1 family in the examples in SYMBOL/SOURCENDL and in the appendix titled "NDL/NDLII Definitions," the host can support two input terminals as a remote host and two output terminals as a local host.

The virtual stations described previously have a terminal type of VSRJEA for asynchronous and VSRJES for synchronous operation. Because terminal classes cannot be assigned in the NDL, the terminal type is used to distinguish stations within RJE. Any terminal type that starts with letters the "RJE" is assumed to be an RJE terminal with device addresses in the range "00" to "04" (for example, RSCs and line printers).

Terminal types that do not start with "RJE" are assumed to be virtual stations. This addressing scheme may require users to change and recompile their NDL when they implement terminal transfer if their NDL specifications do not conform to those listed previously.

User Interface

Pseudo-Station

A remote host uses a "pseudo-station" to transfer data from the RJE file transfer link (input virtual station) to a station controlled by another MCS. for example, CANDE or A Programming Language (APL). A pseudo-station has the same characteristics as a virtual station, except that the device addresses are "0?". "0?". The RJE1 family station in the SYMBOL/SOURCENDL file example has two examples of this type of station.

The pseudo-stations are handled in a pool by RJE; thus, all pseudo-stations are available to any virtual station attached to RJE on the host, and a pseudo-station need not be assigned to a particular line. However, a line assignment is required. One pseudo-station should be declared and assigned to a line for every input virtual station attached to RJE.

RJE Messages for Terminal Transfer

A set of RJE messages and control messages is available to use and control terminal transfer in addition to the messages normally used with file transfer. A summary of these messages follows. (Refer to the "RJE Input Messages" and the "RJE Control Messages" sections for complete descriptions of these messages.)

RJE Input Messages

*CT

Attempts to attach the user's terminal to RJE on the remote host.

*DT

Unconditionally disconnects the station from a remote host.

*RE

Releases the terminal to a specified MCS.

RJE Control Message

VS

Displays the status of all virtual stations associated with RJE.

RJE Terminal Transfer Session Example

The following paragraphs illustrate terminal transfer between two B 6800 systems.

SYS1 Stations -----	SYS2 Stations -----
RJE1 (device address "00")	RJE2 (device address "00")
RJE1RSC ("01")	RJE2RSC ("01")
RJE1CR ("02")	RJE2CR ("02")
RJE1LP ("03")	RJE2LP ("03")
RJE1FTS ("04")	RJE2FTS ("04")
VSOUT1 ("Aa", "aA")	VSIN2 ("aA", "Aa")
	PSEUDO2 ("09", "09") LSN 19
TD83XX ("XX") LSN 296	

The stations described above form the datacomm network on two systems with host names "SYS1" and "SYS2". All the stations on SYS2 are assigned to a single line and form an RJE family. The TD83XX station on SYS1 is a TD830 terminal attached to SYSTEM/CANDE; the remaining stations form an RJE family.

The two hosts are assumed to be connected by a file transfer link between RJE1FTS on SYS1 and RJE2FTS on SYS2. The user at station TD83XX who has to use SYSTEM/CANDE on host SYS2 must enter the following:

?MCS SYSTEM/RJE

This message causes CANDE to release control of the station to SYSTEM/RJE, and the following messages are displayed:

```
#END SESSION 4567 ET=2:13:49 PT=0:0 IO=0:0
#USER = MIKE 11:40:31 04/28/80
[296] RELEASE COMPLETED
```

User Interface

The "#END SESSION" and "#USER" messages are from CANDE. The third response is from RJE and shows that the release was successful. RJE then controls TD83XX and responds to any input from that terminal. The RJE input "HELLO" should be used at this point to activate the station; RJE then gives the following response:

```
B6800 SYSTEM/RJE SYSTEM #456 HOSTNAME = SYS1 32.82.48
MIX = 6019.
```

At this point, RJE either asks for a usercode and password or assigns a session, depending on the setting of the run-time option LOGON (refer to "LOGON" under "SO" in the "RJE Control Messages" section). In this example, LOGON is not set, and RJE displays the following messages:

```
TD83XX LOGGED ON AT 11:41:02 04/28/80.
SESSION 6282.
```

The terminal user can then use any RJE input command (refer to the "RJE Input Messages" section) or ODT input message (refer to the "ODT Input Messages" appendix). The following examples show several commands and RJE responses:

```
WT
    TIME IS 11:50:23

*TF
    #BLKSZ = 400 BUFSZ = 830 FTBLK = 1500

*BACKUP
    #NO BACKUP FILES.
    #END BACKUP REQUEST

A
    --- NO ACTIVE ENTRIES ---
```

RJE REFERENCE MANUAL

If TD83XX has the NDL "SPO" bit set, the *SM command is also valid for use. Refer to the "RJE Control Messages" section. The following examples illustrate uses of this command and the resulting RJE responses:

*SM WH

[084] ACTIVE RJE @ SYS2 (6800) (TTP, FTS[RS], HOST, VER=2)

*SM FTS

[084] RJE1 @ SYS2 NO ACTIVE FILE TRANSFER

Once the terminal is released to RJE on SYS1, the connection to SYS2 is made using the "*CT <host name>" command. Refer to "*CT" in the "RJE Input Messages" section.

*CT SYS2

If the transfer is successful, RJE on host SYS1 displays the following response:

#SUCCESSFUL TERMINAL TRANSFER TO HOST SYS2.

RJE on SYS1 has associated TD83XX with the virtual station "VSOUT1" and is transferring all input and output between them. while RJE on host SYS2 is reading and writing to station VSIN2. At this point, the terminal user can use any RJE command or system input command allowed on the remote host SYS2.

If the terminal user then wishes to use SYSTEM/CANDE (or any other MCS) or the remote host SYS2, the *RE command is used as follows:

*RE SYSTEM/CANDE

Refer to "*RE" in the "Input Messages" section.

User Interface

If the release to CANDE is successful, the following response is displayed:

```
#B6800 :678 CANDE 32.58: YOU ARE PSEUDO2(19)
#RELEASE COMPLETED
#ENTER USERCODE PLEASE
```

At this point, the terminal user is attached to SYSTEM/CANDE on the remote host SYS2. On SYS2, the virtual station "VSIN2" is then associated with the pseudo-station "PSEUDO2", which had been released to CANDE. For the duration of the connection, all input from the terminal goes to CANDE on SYS2 while all output from CANDE goes to the user's terminal on SYS1.

When the user is finished with CANDE on SYS2, he must release the pseudo-station to RJE by entering the message "?MCS SYSTEM/RJE" to CANDE. At this point, the user is again connected to RJE on SYS2. The following responses are displayed:

```
#END SESSION 2645 ET=6.3 PT=0.0 IO=0.0
#USER=MIKE 09:01:39 09/14/81
B6800 SYSTEM/RJE SYSTEM # 678 HOSTNAME=SYS2 32.082.42 MIX=2139
[19] RELEASE COMPLETED
```

To break this connection, the *DT command is entered and the following response is displayed:

```
#TERMINAL TRANSFER TO HOST SYS2 HAS BEEN TERMINATED
```

The user is then communicating with RJE on the local host "SYS1": the BYE message returns the user to SYSTEM/CANDE. Refer to "*DT" in the "RJE Input Messages" section.

HALT/LOAD EFFECTS

If the remote host Halt/Loads while a terminal is connected to it, association between the remote virtual station and pseudo-station is lost, and any tasks using these stations are discontinued. The user should use the *DT command (refer to "DT" in the "RJE Input Messages" section) to free his terminal from the local virtual station to communicate with the local RJE. Once the remote host is back up and the file transfer link is active, the terminal can be retransferred.

If the local host Halt/Loads, the user's terminal is released back to its original MCS by reinitializing datacomm. At this point, the remote pseudo-station is still released to the MCS that last owned it and remains released until either the RJE link is re-established, the station is manually released back to RJE by that MCS, or the remote host Halt/Loads. Until the pseudo-station is released back to RJE, the pseudo-station is not available to any virtual station.

RJE terminates all terminal transfers to a host when it detects that the RJE link has been reinitialized or disconnected. All terminals that are linked will receive the following message:

#RJE LINK INTERRUPTED - TERMINAL TRANSFER HAS BEEN TERMINATED

RJE HALT/LOAD RESTORE

The RJE MCS employs a disk file with the internal name "LINK" and the title "SYSTEM/<MCS name>/LINKFILE" to save information regarding the terminals under its control in the event of a Halt/Load.

Including the MCS name in the linkfile title allows multiple copies of RJE (with different names) to run at the same time and not interfere with each other through their link files. For example, SYSTEM/RJE has the linkfile title "SYSTEM/RJE/LINKFILE". If another copy of the RJE MCS is present with the name "SYSTEM/RJEXX", this second copy must have a linkfile with the title "SYSTEM/RJEXX/LINKFILE" to be declared in the site's NDL.

User Interface

Such items as the states of the various run-time terminal options, usercodes, and phone numbers are saved in the linkfile. The linkfile is always created and sought on the family where the MCS is running. The linkfile consists of a minimum of two 240-word records. The first record contains the mix number and version for RJE and the date and time of the latest Network Information File (NIF) and Data Communications Processor Code (DCPCODE) files. The remaining records consist of 60-word blocks containing information about each terminal followed by 60-word blocks containing restart information for AUTOBACKUP and file transfer.

The present layout of the linkfile is as follows:

Record 0: Linkfile Information Record

(240 words per record)

Word [0]	= RJE mix number.
[50]	= NDL compilation date.
[51]	= NDL compilation time.
[52] - [53]	= RJE level (version).
[54]	= MAXTERMINALS.
[55]	= Number of attached stations.
[56]	= Linkfile version.
[57]	= Run-time options.
.[03:01]	= SPO.
.[02:01]	= RSC.
.[01:01]	= FTSTBUG.
.[00:01]	= Wait state.
[58]	= MAXRJETERMINALS.

Record 1: Terminal Information Blocks

These records contain 5 blocks of 48 words each, as follows:

Word [0]	= Terminal status word.
[1]	= Session number.
[2] - [3]	= Not used.
[4] - [7].[47:24]	= Usercode.
[7].[23:24] - [10]	= Accesscode.
[11]	= Callback information.
[12] - [13]	= File transfer information (FTQARRAY).
[14]	= Print queue information word.
[15] - [47]	= Job numbers queued for output.

Record (RESTARTRECORDLINK): AUTOBACKUP Restart Records

These records contain 5 blocks of 48 words each, as follows:

Word [0].[15:16]	= Job number being printed.
[23:08]	= RJE-supplied uniqueness number.
[1].[47:16]	= Backup record at which to resume.
[31:12]	= Index within backup record.
[2].[47:08]	= Number of characters in directory to be printed (PB).
[38:12]	= User-specified number of copies.
[27:12]	= User-specified save or not.
[23:04]	= Number of levels in directory.
[19:04]	= Directory full file name.
[3].[47:12]	= Copies printed.
[35:12]	= Number of characters of current file.
[5] - [47]	= Name of file currently printing.

User Interface

Record (CALLBACKRECORDLINK): Callback Phone Numbers

These records consist of 20 blocks of 12 words each. Each record contains the callback phone number for a specific UNITNUMBER.

Word [0].[47:08] = Length of phone number.

Record (RECVSTORE): FILER Restart Recovery Records

This record consists of 3 blocks of 80 words each, containing a copy of FTRECV for restart capabilities. One record is present for each file transfer station.

Record (COPYQUEUE): Queued Copy Requests (FILEX)

These records consist of 240 words and contain all link heads and tails pointers and all queued counts. One word is present for each file transfer station, with UNITNUMBER the index into the record; each word has the following format:

[47:08]	= Number of entries in list (puts queued).
[39:04]	= Relative block number of tail of list.
[35:16]	= Relative record number of tail of list.
[19:04]	= Relative block number of head of list (current).
[15:16]	= Relative record number of head of list.

Word [238] = Points to last record and block in use.

Word [239] = Points to head and tail of the available record and block list.

Record (COPYQUEUE + 1)

These records contain 3 blocks of 80 words each, as follows:

Word [0]	= Link to next entry in list (0 = last entry).
. [19:04]	= Relative block number of next entry.
. [15:16]	= Relative record number of next entry.
Word [1] - [79]	= Copy of FTSEND.

NOTE

The structure of this file is subject to change on future releases.

If the RJE MCS is terminated with a fault, the linkfile should be removed before the MCS is reactivated.

To ensure the correct linkfile format, SYSTEM/RJE checks the "linkfile version" stored in word 56 of record 0 at initialization. If the version of SYSTEM/RJE and its linkfile do not agree, the linkfile is discarded. In addition, the linkfile is discarded whenever a possibility exists that it is incompatible with a new datacomm environment. Currently, an old linkfile can be discarded for any of the following reasons:

1. NDL file (DCPCODE and NIF) has changed.
2. MAXTERMINALS in SYSTEM/RJE has changed.
3. Linkfile version is not correct.
4. Parity error exists in reading old file.

Each of these conditions causes SYSTEM/RJE to display an appropriate message.

NOTE

The RJE "WAIT", "FTSBUG", "SPO", and "RSC" run-time options are maintained at BOJ, even if the old linkfile is being purged due to incompatibility. See the "Control Messages" section.

User Interface

Following a Halt/Load, RJE automatically restarts a session to a remote terminal at the host site, provided that the following statements are true:

1. The remote terminal was active before the Halt/Load.
2. The remote terminal had the run-time option "LOGON" reset (no usercode was required).
3. The linkfile was inactive after the Halt/Load.
4. The remote terminal was on a leased (nonswitched) line.

RJE then displays its header message followed by the word "RESTARTING". Any AUTOBACKUP that was running at Halt/Load time is continued or restarted, depending on the setting of the user terminal option CONTBACKUP. Any card input or "WFLCOMPILER[xx]" task that was active is lost. Refer to "CONTBACKUP" under "*SO" in the "RJE Input Messages" section.

RJE does not restart automatically after a Halt/Load if it was initiated in either of the following ways:

1. Run using the ODT primitive "??RUN" command.
2. Run by the DCP in response to new station activity.

In the preceding cases, RJE restarts only when:

1. Station activity is present.
2. RJE is forced to run using the WFL "RUN" command (or ODT "??RUN" primitive command).
3. EOT or EOJ notification from the CONTROLLER of an AUTORECOVERY has restarted an RJE task or job.

RJE REFERENCE MANUAL

For RJE to restart automatically, the AUTORECOVERY and AUTODC run-time ODT options must be set and RJE must have been run (not using the ODT "??RUN" primitive command).

Regardless of how RJE restarts, if the conditions described in the preceding paragraphs are met, the remote terminal restarts. Also, RJE marks a station as active if all the following conditions are true when RJE is restarted:

1. The station was active at the termination of the prior execution of RJE.
2. The station is on a leased (nonswitched) or direct-connect line.
3. NOLOGON is set (station does not require usercode/password).
4. No accesscode or station ID is required.

4 RJE INPUT MESSAGES

INTRODUCTION

Three types of input messages are accepted by RJE: RJE input messages, RJE control messages, and system Operator Display Terminal (ODT) input messages. To avoid conflict with the system ODT messages, which are forwarded to the Master Control Program (MCP) CONTROLLER, all messages that are handled directly by the RJE Message Control System (MCS) must begin with the asterisk character (*). These RJE input messages and their syntax and explanation descriptions are presented in this section.

* ACCESS

Syntax

```

-- * -- ACCESS -----
|
|-----|
| - . -----|
|
|-----|
| - <accesscode> -----|
|
|-----|
|                               |-----|
|                               | <password> -|
|                               |
|                               |-----|
|                               | / -|
|                               |
|-----|

```

Explanation

The *ACCESS input message interrogates or changes the accesscode of a session.

ACCESS returns the current accesscode for the session (not including the password).

"ACCESS ." assigns a null accesscode to the session.

ACCESS: "<accesscode>/<password>" assigns or changes the session
accesscode after validation in the USERDATAFILE.

Changes of accesscodes to a session are logged.

Example

* ACCESS AC/PW

RJE Input Messages

BACKUP*Syntax**

```

-- * -- BACKUP -----|
                |               |
                |-<output specification>-|

```

<output specification>

```

--<job number>-----|
                |               |
                |-/11\-<task number>-| |-<file name>-|

```

<job number>

Any number between 1 and 9999, inclusive.

<task number>

A slash followed by a number between 1 and 9999, inclusive.

<file name>

A slash followed by a three-digit number and the internal file name. If the internal file name contains nonalphanumeric characters, it must be enclosed in quotes.

Explanation

The *BACKUP input message lists all RJE printer output available, printer output associated with a particular job, or a subset of the printer output for a particular job that can be printed at the station. This input message does not show which jobs are queued for output. An estimate of the number of pages required to print the specified file and, if appropriate, the form required are printed along with the output name.

The *BACKUP input message is used primarily to display the output available so that a selective subset can be printed using the *ME input message.

The "**BACKUP RJE" request runs asynchronously with RJE, allowing the other stations in the RJE network to continue working when large numbers of REMLP and REMCP files are involved.

A "**BACKUP RJE" request that is entered while another such request is in progress results in the following message:

```
#BACKUP REQUEST ALREADY ACTIVE.
```

When the RJE print queue is being rebuilt at RJE initialization, *BACKUP requests are not allowed and result in the following message:

```
#NOT ALLOWED WHILE PRINT QUEUE REBUILD IN PROGRESS.
```

Any station that requests information during the rebuild is notified that the rebuilding operation is complete by the following message:

```
#PRINT QUEUE REBUILD FINISHED.
```

Examples

The following directory on disk or pack is used in the subsequent examples:

```
REMLP02
. 0000503
. . 0000520
. . . 000CHECKS

. . 000SUMMARY
. 0000524
. . 0000531

. . . "000REPORT FOR JOE"

. . 000SUMMARY
. 0000545
. . 0000563

. . . 000LINE
. . . 001LINE
. . 000573
. . . 000F

. . 000SUMMARY
```

RJE Input Messages

NOTE

"SUMMARY" files are special system files used by RJE to print headings and are not shown in the output from the *BACKUP command.

The following input message shows all printer output for this station:

*BACKUP

PRINTER BACKUP
503/520/000CHECKS.22 PAGES.FORM="CHECKS"
524/531/"000REPORT FOR JOE",2000 PAGES
545/563/000LINE.20 PAGES
545/563/001LINE.25 PAGES
545/573/000F.10 PAGES
#

The following input message shows all printer backup for job 545:

*BACKUP 545

PRINTER BACKUP 545
563/000LINE.20 PAGES
563/001LINE.25 PAGES
563/000F.10 PAGES
#

The following message shows printer backup for a subset of the entire job:

*BACKUP 545/563

PRINTER BACKUP 545/563
000LINE.20 PAGES
001LINE.25 PAGES
#

The following input message shows a specific file:

*BACKUP 545/563/001LINE

PRINTER BACKUP 545/563/001LINE
25 PAGES
#

BYE**Syntax**

```
----- BYE --|  
|           |  
|- * -|
```

Explanation

BYE is the only RJE input message for which the initial "*" is optional.

The BYE input message terminates the current session. Any active job initiated by the terminal that ends the session is left active. If a copy of the AUTOBACKUP routine is servicing this terminal, the routine is allowed to go to end-of-task (EOT) and remove the backup file. But if the remote reader is currently reading a job deck -- that is, if a copy of the Work Flow Language (WFL) compiler is currently active and servicing the terminal -- then the card reader is cleared and the deck is discarded. When the logged-off terminal is idle and switched, the terminal is disconnected. If no other RJE terminals are currently active, the RJE MCS then goes to EOT.

The RJE MCS responds to the BYE input message with the following output message:

```
<station name> LOGGED OFF AT <time> <date>.
```

If the card reader had to be cleared, the RJE MCS also issues the message:

```
#CR CLEARED.
```

The terminal is also notified to disable the remote card reader if it is secured. The user must supply a valid usercode and password before activity can be resumed.

RJE Input Messages

SYSTEM/RJE can refuse a log off from a terminal if terminal-initiated jobs are still running and one of the following conditions exist:

1. RJE has no dial-out capabilities.
2. No phone number has been supplied.
3. The terminal option "CALLBACK" has not been set.

If log off is refused, the RJE MCS issues the following message:

#BYE ABORTED. NEED PHONE NUMBER.

The proper response to this message is either to supply RJE with the terminal <phone number> using the *PH input message or to reset the CALLBACK option using the *RO input message. The BYE input message can then be repeated.

Example

* BYE

RJE Input Messages

Explanation

The *CE (Change Entry) input message modifies or interrogates entries in the print queue. The format of the output is similar to that of output from the *SP input message. The values of RESTART, CONTINUE, SAVE, and COPIES have no effect on punch output. For example, if SAVE is specified for the <print queue entry>, the punch output for that entry is output once and then the corresponding files are removed. The printer output is printed the number of times specified by the COPIES option and retained. RJE verifies that the *CE input message results in physical action. The semantics associated with some of the uses of *CE are discussed in the following paragraphs.

*CE

This input message returns the following information:

1. A print queue identification number. If this entry is continued after an interruption, then a "C" precedes this number.
2. If the entry is a result of a *CE or *ME input message that input message is reconstructed and displayed within parentheses. Refer to "*ME" in this section.
3. The file name and page number of the file being printed.
4. If the number of copies specified is greater than one, the number of the currently printing copy.

*CE <print queue entry>

The information given for *CE is returned for the specified job in the print queue.

*CE <print queue entry> SAVE

AUTOPRINT does not remove any files while performing the request specified by the given print queue entry.

*CE <print queue entry> COPIES=<integer>

The number of copies specified by <integer> are printed for the specified job.

*CE <print queue entry> CONTINUE

RJE REFERENCE MANUAL

The specified job is to be continued if it is interrupted, regardless of the value of CONTBKUP.

*CE <print queue entry> RESTART

The specified job is marked to be restarted rather than continued, regardless of the value of CONTBKUP.

*CE <print queue entry> + <integer>

*CE <print queue entry> - <integer>

For one of these forms of the input message to be useful, the specified job number must be marked as CONTINUE and must have been previously interrupted. The printer position (stored by RJE) of the job is moved ahead (+) or back (-) the number of pages specified by <integer>. If entry of this input message causes the page number to be less than or equal to zero, RJE continues printing at the beginning of the current backup file. If entry of the input message causes the page number to be greater than the number of pages in the current print file, RJE resumes printing at the next print file.

For example, file 001LINE of the following backup directory is being printed:

545/563/000LINE
545/563/001LINE
545/573/000F

If an interruption occurs and use of the *CE input message causes the page count to be decreased to a value less than or equal to zero, printing resumes at the beginning of 001LINE. If the page count from AUTOPRINT is increased past the size of 001LINE, printing restarts with 000F.

Care should be taken when manipulating print queues to prevent the removal of files that are required for printing at some later time. For example:

*ME 545
545.3 QUEUED(ME 545)

*ME 545/563 SAVE
545.4 QUEUED(ME 545/563 SAVE)

RJE Input Messages

If no other queue manipulation is done, then when queue entry 545.4 is about to be printed, AUTOPRINT discovers that no output files are available to be printed because queue entry 545.3 removed all the files under its directory, thus removing the files 545.4 would have printed. To avoid this situation, either 545.4 should have been entered before 545.3 or SAVE should have been specified for 545.3. No situation should ever arise in which the operator cannot prevent the unwanted removal of backup files if the appropriate *ME input messages and the features provided for manipulation and interrogation of the print queue are used.

A very important point must be made about the representation of printer position. Although communication to RJE is in terms of pages, internal storage is performed in terms of backup records. RJE uses approximating formulas that transform pages into backup records or backup records into pages. Page numbers indicate where printing is to start, but RJE cannot go back the exact number of pages specified or even start at the beginning of a page. Access could be given to the backup record number, but such access would not be useful; in any event, manual correlation of pages and backup records would be less accurate than the RJE formulas.

Examples

*SP

```
PRINT QUEUE
C 545.2(ME 545/563 SAVE) FILE=000LINE(0)
C 524
#
```

*CE

```
C 545.2(ME 545/563 SAVE) FILE=545/563/000LINE(1)
```

*CE 545.2 RESTART

```
545.2 (ME 545/563 SAVE) FILE=545/563/000LINE(2)
```

*CE 545.2 CONTINUE

```
C 545.2(ME 545/563 SAVE) FILE=545/563/000LINE(3)
```

*CE 545.2 COPIES=5 SAVE=FALSE

```
C 545.2(ME 545/563 COPIES=5) FILE=545/563/000LINE(4) COPY=1
```

*CE 545.2 COPIES=1 SAVE

```
C 545.2(ME 545/563 SAVE) FILE=545/563/000LINE(5)
```

*CE 524

C 524

*CE 524 RESTART

C 524

*CE 524 CONTINUE

C 524

*SP

PRINT QUEUE

C 545.2(ME 545/563 SAVE) FILE=000LINE(13)

C 524

#

After a Halt/Load occurs:

*SP

PRINT QUEUE

C 545.2(ME 545/563 SAVE) FILE=000LINE(13)

C 524

#

*PB 524

#

*SP

PRINT QUEUE

C 524

C 545.2(ME 545/563 SAVE) FILE=000LINE(13)

#

*CE 545.2 +3

C 545.2(ME 545/563 SAVE) FILE=545/563/000LINE(16)

RJE Input Messages

*CHARGECODE

Syntax

```

----- * -- CHARGE -----|
|                               | |
|- * -- CHARGECODE -| |-<chargecode>-|

```

Explanation

The *CHARGECODE input message interrogates or changes a chargecode during a session. If the <chargecode> is omitted, the current setting is queried. If a valid or syntactically correct chargecode is specified, one of the following results occurs:

1. The chargecode of the previous session is billed for the elapsed usage.
2. The <chargecode> specifies the new chargecode of the new session.
3. A message is displayed showing elapsed time charged to the session's old chargecode and the time that the new chargecode was logged on.

If the <chargecode> is not syntactically correct, the following error message is returned:

```
#CHARGECODE NAME ERROR
```

If the <chargecode> is invalid, the following error message is returned:

```
#INVALID CHARGECODE
```

CLEAR*Syntax**

```
-- * -- CLEAR -----|
      |         |
      |- CR -|
      |         |
      |- LP -|
      |         |
      |- CP -|
```

Explanation

The *CLEAR input message clears the remote card reader or specified remote device. When the card reader is cleared (by specifying CR or by omitting the device mnemonic), the copy of the WFL compiler currently servicing the terminal is discontinued and the job deck being read in is discarded. RJE responds to the "**CL CR" keyin with the following message:

```
#CR CLEAR.
```

Printing and/or punching of the current backup file can similarly be discontinued by specifying the line printer (LP) or card punch (CP) as the device to be cleared. The CP device mnemonic is acceptable only if RJE was compiled with the REMOTEPUNCH compile-time option set. If LP is specified, the backup file is discarded. Refer to "REMOTEPUNCH" under RJE Compile-Time Options in the "RJE Compilation" section.

Example

```
* CL
```

```
CR CLEAR
```

*CT

Syntax

```
-- * -- CT --<host name>--|
```

Explanation

The *CT (Connect Terminal) input message attempts to attach the user's terminal to the RJE MCS or to System Communications Module (SYCOM) on a B 1000 Series system on the remote host specified by <host name>. To use this message, the Network definition Language (NDL) must be properly defined (refer to "Terminal Transfer" in the "User Interface" section).

The local host must first approve the *CT request. If not, RJE on the local host responds with one of the following responses:

1. #HOST <host name> DOES NOT SUPPORT THIS FUNCTION.

The requested host is not capable of terminal transfer.

2. #NOT ALLOWED FOR THIS STATION.

The station at which the *CT command was entered cannot be transferred. (This case occurs for RJE terminals with device addresses of "00" through "04".)

3. #HOST <host name> IS NOT CONNECTED TO THIS HOST.

No file transfer link to the requested host exists (refer to "ONLINE" in the "RJE Control Messages" section).

4. #HOST <host name> CANNOT SUPPORT ANOTHER STATION AT THIS TIME.

All virtual stations (output stations on the local host) are in use.

5. #STATION ALREADY CONNECTED TO <host name>.

The station has already been transferred.

6. #*CT NOT ALLOWED WHILE TERMINAL TRANSFERRED.

The station has already been terminal-transferred.

RJE REFERENCE MANUAL

7. #*CT REQUEST PENDING, PLEASE WAIT OR ENTER *DT

The "Connect Reply" has not been received.

If the local host accepts the *CT request, the request is forwarded to the remote host for additional checks. If the remote host does not accept the request, one of the following messages is displayed:

1. #UNABLE TO TRANSFER TERMINAL BECAUSE OF INVALID ADDRESS OR SYSTEM FULL.

The remote host cannot accept another station, or the virtual station address is invalid.

2. #UNABLE TO TRANSFER TERMINAL NO MCS READING ON STATION.

This message can only be received from a B 800 or B 1800 host.

3. #UNABLE TO TRANSFER TERMINAL STATION INUSE.

The virtual station address is already in use on the remote host.

4. #UNABLE TO TRANSFER TERMINAL FOR REPLY VALUE = xx.

The *CT request is of an unknown value (given by xx).

If the remote host accepts the *CT request, the following message is displayed:

#SUCCESSFUL TERMINAL TRANSFER TO HOST <host name>.

However, if *DT is entered before a "Connect Reply" is processed, the following message is displayed:

*CT REQUEST CANCELLED

Example

* CT SYS456

DL*Syntax**

```
-- * -- DL --|
```

Explanation

The *DL (Display DCP and Line) input message is an MCS debugging aid available only when RJE is compiled with the RAID compile-time option set. Refer to "RJE Compile-Time Options" in the "RJE Compilation" section.

RJE responds to the *DL message by displaying the number of the DCP controlling the terminal and the number of the datacomm line on which the terminal is located in the following format:

```
#DCP <DCP number> LINE <line number>.
```

Example

```
* DL .
```

```
# DCP: 1 LINE: 2
```

DP*Syntax**

```

      | <-----|
      |         |
-- * -- DP -----|
      |         |
      | - ALL -----|
      | - ARRAYS -----|
      | - BASE -----|
      | - CODE -----|
      | - DBS -----|
      | - FILE -----|
      | - FILES -----|
      | - LIBRARIES -----|
      | - PRIVATELIBRARIES -|
      | - SIBS -----|

```

Explanation

The *DP (Dump Program) input message is an MCS debugging aid available only when RJE is compiled with the RAID compile-time option set. Refer to "RJE Compile-Time Options" in the "RJE Compilation" section.

RJE responds to the *DP input message by invoking a program dump of the MCS and producing a dump of the RJELINKED file on the PRINTFILE line printer listing. When this activity is complete, a "#" is issued at the Remote Supervisory Console (RSC).

Example

*DP

DS

Syntax

```
-- * --<mix number>-- DS --|
```

Explanation

The DS (DiScontinue) input message stops the AUTOBACKUP routine from continuing to print or punch the current backup file and purges this file from the directory. This message should be used instead of the ODT "DS" command when discontinuing an execution of AUTOBACKUP because the routine does not fire up automatically when DS is used until a *PB input message is entered (the *CL input message can also be used). If the <mix number> indicated is not the <mix number> of a copy of AUTOBACKUP that is currently servicing the terminal, RJE responds with the following message:

```
#INV KEYIN.
```

Example

```
* 1234 DS
```

DT*Syntax**

-- * -- DT --|

Explanation

The *DT (Disconnect Terminal) input message unconditionally disconnects a station from a remote host. After a terminal is transferred and connection has been made to a remote host, *DT is the only message to which the local RJE responds without forwarding the message as text to the remote RJE. Refer to "**CT" in this section.

The following are the system responses to the *DT input message:

1. #INVALID REQUEST - TERMINAL IS NOT TRANSFERRED.

The *DT input message was entered at a station that was not transferred to a remote host.

2. #TERMINAL TRANSFER TO HOST <host name> HAS BEEN TERMINATED.

The terminal transfer terminated successfully.

Example

*DT

RJE Input Messages

*FM

Syntax

```

-- * ---<mix number>-- FM -----|
      |                               |
      |- FM -----|
            |
            |-<formmessage string>-|

```

Explanation

The *FM (Form Message) input message is a "form message" keyin directed to a copy of the AUTOBACKUP routine that is currently servicing the terminal. The *FM input message resumes AUTOBACKUP activity after a backup file has been encountered with a value assigned to the FORMMESSAGE attribute.

"*<mix number>FM" resumes printing at the RJE terminal. If the <mix number> indicated is not the <mix number> of a copy of AUTOBACKUP currently servicing the terminal, RJE responds with the following message:

```
#INV KEYIN.
```

*FM displays the current FORMMESSAGE string.

"*FM <formmessage string>" forms the terminal printer with the given <formmessage string>.

When the remote printer is formed, all output files have the FORMMESSAGE attribute checked against the formed message of the printer. If the attribute and message match, the "FM REQD" message is displayed followed by "(CONTINUED)", and printing proceeds. If the attribute and message do not match, printing stops and the "FM REQD" message is displayed.

RJE REFERENCE MANUAL

"*FM <formmessage string>" does not reactivate an AUTOPRINT job that is waiting for FORMMESSAGE specification. All printer output that does not have an associated FORMMESSAGE attribute is assumed to require standard 1-part paper. Refer to the discussion of the remote site option "IGNOREFM" under "*SO" in this section.

Example

* FM

LP NOT FORMED.

LC*Syntax**

```
-- * -- LC --<text>--|
```

Explanation

The *LC (Log Comment) input message enters the given <text> in the system log as an MCS message entry associated with the current session number. The MCS responds by displaying "#" at the RSC.

Example

```
* LC BEGIN TEST
```

*ME

Syntax

```

-- * -- ME ----->
      |
      |-<output specification>-|
      |
      |<-----|
      |
      >-----|
      |
      |-/1\ - COPIES -----<integer>-|
      |               | |
      |               | - = - |
      |
      |-/1\ - SAVE -----|
      |               |
      |               |----- TRUE ----| |
      |               | |
      |               | - = - | - FALSE ---|

```

Explanation

The *ME (Make Entry) input message creates a new entry in the print queue. This new entry only directs output to the printer and does not punch any output. RJE responds to an *ME input message with one of the following messages:

NO BACKUP ON DK OR PK

JOB ACTIVE

<queue entry> QUEUED

Queued backup is placed at the end of the print queue. The <queue entry> is used to distinguish between print requests from the same job and is of the form "YYYY.XX", where "YYYY" is the number of the job that created the printer backup and "XX" is an RJE-supplied "uniqueness" number. A special heading, containing the word "PRINT" in block letters along with "<job number>.<uniqueness number>" and the *ME input message that was used, is printed before the associated files are printed.

RJE Input Messages

After the backup files are printed, they are purged unless the *ME input message specifies SAVE. The value of COPIES determines the number of copies of the listing that are to be printed at the RJE station; the default value is 1, and the valid range of values is between 1 and 1023, inclusive. The use of "SAVE" alone or "SAVE TRUE" saves the files; the use of "SAVE FALSE" purges the backup files.

Examples

*ME 545 COPIES=2 SAVE

545.1 QUEUED(ME 545 COPIES=2 SAVE)

*SP

PRINT QUEUE

C 503

C 545.1(ME 545 COPIES=2 SAVE)

#

*BACKUP 545

PRINTER BACKUP 545

563/000LINE,20 PAGES

563/001LINE,25 PAGES

573/000F,10 PAGES

#

*ME 545/563 SAVE

545.2 QUEUED(ME 545/563 SAVE)

*SP

PRINT QUEUE

C 503

C 545.2(ME 545/563 SAVE)

C 545.2(ME 545/563 SAVE)

NOPASSWORD**Syntax**

```
-- NOPASSWORD --|
```

Explanation

The NOPASSWORD input message allows remote terminals (B 700 Series) that use "." as a control character for their own RJE firmware to log on without a password. This input message should be entered when RJE requests a password during the log-on sequence.

Example

RJE output message:

```
# ENTER PASSWORD PLEASE
```

User response:

```
NOPASSWORD
```

*PB

Syntax

```

-- * -- PB -----|
          |         | |
          |-----<job number>--| |-. <uniqueness number> -|
          |         |
          |-----|
          |-----|

```

Explanation

The *PB (Print/punch Backup) input message changes the relative positions of entries in the print queue and can be used to create an additional print queue entry. The semantics for each use of *PB are discussed in the following paragraphs.

***PB**

When AUTOPRINT suspends itself after printing a formed backup file, *PB is used to resume AUTOPRINT.

***PB <job number>**

*PB <job number> causes the backup produced by <job number> to be the next backup files output to the printer. Only completed tasks are printed.

***PB <job number>.<uniqueness number>**

*PB <job number>.<uniqueness number> moves entries created by an *ME input message to the head of the print queue.

***PB - <job number> *PB - <job number>.<uniqueness number>**

The two "**PB -" input messages remove the specified entries from the print queue. Any print queue entry that is already printing cannot be deleted.

RJE REFERENCE MANUAL

If CONTBACKUP is set (the default value), listings are automatically continued across an interruption. This default continuation can be changed using a *CE input message. Refer to "**CE" in this section.

If no such file is in the backup directory, RJE responds by displaying the following message at the RSC:

```
#FILE NOT ON DISK.
```

If the specified job is still active, the keyin is ignored and RJE responds with the following message:

```
#JOB IS ACTIVE.
```

If the request is accepted, RJE responds with "#" or "#PENDING." if AUTOBACKUP is already active.

Example

```
*SP
```

```
PRINT QUEUE  
C 503 FILE=503/520/000CHECKS(22)  
C 545.1(ME 545 COPIES=2 SAVE)  
C 545.2(ME 545/563 SAVE)  
#
```

```
*STATUS
```

```
#0200 AUTOPRINT/LSN038/"#0200" -- ENTER "**PB" TO CONTINUE  
#NO TASKS ACTIVE
```

```
*PB
```

```
#
```

```
*SP
```

```
PRINT QUEUE  
C 545.1(ME 545 COPIES=2 SAVE)  
C 545.2(ME 545/563 SAVE)
```

RJE Input Messages

*PB 524

#

*SP

PRINT QUEUE

C 524

C 545.1(ME 545 COPIES=2 SAVE)

C 545.2(ME 545/563 SAVE)

#

*PB 545.2

#

*SP

PRINT QUEUE

C 545.2(ME 545/563 SAVE)

C 524

C 545.1(ME 545 COPIES=2 SAVE)

#

*PB -545.1

545.1 DELETED

*SP

PRINT QUEUE

C 545.2(ME 545/563 SAVE)

C 524

#

PER*Syntax**

```
-- * -- PER --|
```

Explanation

The *PER (PERipherals) input message displays the ready/not ready status of peripheral devices for a remote station. *PER only reports the status of devices whose status is reported to the host system by the remote processor; thus, not all occurrences of devices going ready or not ready are reported for most systems.

Example

```
* PER
```

```
[053] RSC  READY  
[054] CARD READY  
[055] PRINT READY  
[056] FTS  READY
```

PH*Syntax**

```
-- * -- PH -----|  
                |  
                |-<phone number>--|
```

Explanation

The *PH (PHome) input message causes the specified <phone number> to be associated with the terminal for call-back. The <phone number> can be a 1- to 71-character string. If the <phone number> and terminal are successfully associated, RJE displays the following response:

```
#PHONE NUMBER: <phone number>.
```

If the <phone number> and terminal cannot be associated, RJE displays the following response:

```
#INV KEYIN.
```

If *PH is entered without a <phone number>, the current <phone number> is returned.

Example

```
* PH 123456
```

```
# PHONE NUMBER: 123456...
```

QT**Syntax**

```
-- * --<mix number>-- QT --|
```

Explanation

The QT (Quit) input message stops the AUTOBACKUP routine from continuing to print (or punch) the current backup file but leaves that backup file in the directory. If the specified <mix number> is not the <mix number> of a copy of AUTOBACKUP that is currently servicing the terminal, RJE responds with the following message:

```
#INV KEYIN.
```

Example

```
* 1234 QT
```

RJE Input Messages

*RE

Syntax

```

-- * -- RE -----<MCS name>--|
          |         | |         |
          |-<LSN>-| | - TO -|

```

Explanation

The *RE (RElease) input message causes the station indicated by the optional <LSN> or, if no <LSN> is specified, the station at which the request is entered to be released (detached from RJE and attached) to the indicated MCS. The MCS number and the logical station number (LSN) of any input virtual station that has been released to another MCS is displayed. If the <LSN> does not belong to one of the stations of the terminal at which the command was entered, RJE responds with the following message:

```
#INVALID LSN
```

If the requested <MCS name> is not declared in the host NDL, RJE responds with the following message:

```
# INVALID MCS
```

If the terminal has been transferred to a remote RJE using the "**CT <host name>" statement, only the non-LSN version of the request is allowed, and specification of an <LSN> causes RJE to return the following message:

```
#LSN NOT ALLOWED
```

RJE REFERENCE MANUAL

If the remote RJE is unable to complete the release because of an insufficient number of pseudo-stations, RJE responds with the following message:

NO PSEUDO STATION AVAILABLE

Refer to "Terminal Transfer" in the "User Interface" section.

Examples

*RE 39 SYSTEM/APL

*RE SYSTEM/CANDE

RJE Input Messages

*RO

Syntax

```

-- * -- RO --- AUTOBACKUP -----|
|                                  |
| - CALLBACK -----|
| - CONTBACKUP --|
| - IGNOREFM -----|
| - REMOTEPUNCH -|

```

Explanation

The *RO (Reset Option) input message resets the specified RJE terminal option. RJE responds to an *RO input message by displaying the following message at the RSC:

<option name> RESET

If the option name specified is illegal, RJE responds with:

#INV KEYIN.

(Refer to "**SO" in this section.)

Example

```

*RO CONTBACKUP

CONTBACKUP RESET

```

RS*Syntax**

```
-- * -- RS --<text>--|
```

Explanation

The *RS (Response Solicited) input message is used when the remote terminal requires main system operator intervention. The MCS processes a task named "RJE/RSVP/LSN<LSN>" in response to this input message which hangs in the mix displaying the <text> until the operator accepts the task. The <text> can consist of up to 418 characters (430 with a fixed heading). and the output up to 960 characters. The response is returned to the RSC in the following form:

```
#SPO REPLY: <returned text>
```

The *RS input message should be used only for critical service requests.

Example

```
* RS PLEASE LOAD THE TAPE
```

RJE Input Messages

SB*Syntax**

```
-- * -- SE --<job number>--|
```

Explanation

The *SB (System Backup) input message is similar to the *PB input message, except that the *SB input message initiates the printing or punching at the main system printer or card punch of all backup files destined for the terminal and generated by the job indicated by the specified <job number>. This printing or punching is initiated by zipping the SYSTEM/BACKUP utility. (Zip is commonly used to automatically initiate compilations.)

RJE responds to an *SB input message by displaying a "#" at the RSC.

Example

```
* SB 1234
```

SF*Syntax**

```

      |<-----|
      |
-- * -- SF ----- BLKSZ ----- <integer> -----|
      |           | |           |
      |- BUFSZ -| |- = -|
      |           |
      |- FTBLK -|

```

Explanation

The *SF (Set Factors) input message specifies certain buffers' sizes that are used by RJE for the terminal.

BLKSZ indicates the characters per transmission blocking factor (that is, the number of characters that can be shipped over the datacomm line per transmission).

BUFSZ indicates the buffer size, in characters, of remote printer output, punch output, or both (that is, the number of characters to be buffered in core when sending output to the remote printer or punch).

FTBLK indicates the maximum number of characters that are allowed in an output file transfer block. The value of FTBLK should be the same on both host systems involved in a file transfer. If both hosts are B 6000 or B 7000 Series systems, RJE allows the transfer of files whose MAXRECSIZES are greater than FTBLK by splitting the record across several blocks.

RJE Input Messages

The following defaults and limits are imposed on the values of these buffer sizes:

Value -----	Default -----	Limit -----
BLKSZ	400	132 through 1500 (inclusive)
BUFSZ	820	132 through 2000 (inclusive)
FTBLK	1500	400 through 2000 (inclusive)

These values should be changed with the utmost care to avoid exceeding the limits of the remote terminal or datacomm line.

Example

*SF BLKSZ = 400

*SM

Syntax

```
-- * -- SM --<any RJE control message>--|
```

Explanation

The *SM (Send MCS) input message allows the terminal to enter any RJE control message that normally would be valid only if entered using the ODT "SM" command. Refer to the "RJE Control Messages" section for descriptions of RJE control messages.

Use of the *SM input message is controlled by the control messages "RSC" (for the station with device address "01" on an RJE family of stations) or "SPO" (for non-RJE terminals). Refer to the "RJE Control Messages" section for descriptions of these control messages. If the corresponding option is not set for the terminal ("RSC" for an RJE station or "SPO" for a non-RJE station), the *SM input message is controlled by the NDL "SPO" station bit.

If the RSC or SPO option is reset and the NDL SPO bit is not set (SPO = FALSE) for the station, the *SM command is invalid for that station, and any attempt to use this message causes the following error message to be displayed:

NOT ALLOWED

NOTE

Two RJE compile-time options, RSC and SPO, are reset by default and have the same meanings as the corresponding run-time options. Refer to "RJE Compile-Time Options" in the "RJE Compilation" section.

RJE Input Messages

Examples

*SM WH

*SM COPY A (USER=X/Y) FROM DISK (HOST=SYS1) TO FRED (HOST=SYS2)

*SM TF

*SO

Syntax

```
-- * -- SO --- AUTOBACKUP -----|
      |                                |
      |- CALLBACK -----|
      |                                |
      |- CONTBACKUP --|
      |                                |
      |- IGNOREFM -----|
      |                                |
      |- REMOTEPUNCH -|
```

Explanation

The *SO (Set Option) input message sets the specified RJE terminal options. RJE responds by displaying the following message at the RSC:

<option name> SET

If the option name specified is illegal, RJE responds with the following message:

#INV KEYIN.

The five run-time terminal options have the following effects:

AUTOBACKUP

When AUTOBACKUP is set, the RJE AUTOBACKUP routine is fired up automatically to output backup files to the remote terminal when RJE is notified of an end-of-job (EOJ), or when AUTOBACKUP goes to EOT after handling the output files of a previous job and other jobs are queued to be serviced. A job is queued whenever an RJE terminal is notified of an EOJ.

CALLBACK

When CALLBACK is set and an Automatic Calling Unit (ACU) is present on the line, RJE dials out to a terminal to transmit backup files produced by a job that has just gone to EOJ. The phone number used is specified using the *PH input message. Refer to "*PH" in this section.

RJE Input Messages

CONTRBACKUP

The CONTRBACKUP option is set by default; the value of this option can be displayed by using the *TO command or changed by using the *RO and *SO input messages. If CONTRBACKUP is set and a listing is interrupted, the listing continues at a point close to, and prior to, the point of interruption rather than restarting from the beginning.

If CONTRBACKUP is reset, the listing restarts at the beginning of the current copy. A special header containing "CONT" (an abbreviation for "continue") in block letters along with the job number is printed before the listing is continued. Thus, listings that have been continued can be easily identified. This default continuation can be overridden at print time.

As RJE AUTOBACKUP is printing a listing, the linkfile is updated periodically to reflect the last page printed. When RJE recovers from an interruption, the number from the linkfile is used to continue the listing. The RJE operator is granted read/write access to this number. Listings can be restarted or continued on a per-job basis. Punch output is not continued regardless of the value of CONTRBACKUP.

IGNOREFM

The IGNOREFM remote site option causes the RJE MCS to ignore all forms requests from the AUTOPRINT and AUTOPUNCH routines for formed printers and punches. RJE display requests from an *FM input message but does not halt printing or punching.

REMOTEPUNCH

When REMOTEPUNCH is set, all punch backup files are output to the remote card punch, which must be present and handled properly by the remote computer. Otherwise, punch backup files are output to the central system card punch.

Example

*SO CONTRBACKUP

CONTRBACKUP SET

SP*Syntax**

-- * -- SP --|

Explanation

The *SP (Show Print queue) input message displays a list of the job numbers in the print queue for the terminal. If no backup files are queued, RJE displays the response "NO ENTRIES."

The display can include the following information for each print queue entry:

1. If the entry is continued after an interruption, a "C" precedes the identification number. This continuation/restart flag is set by the value of CONTBKUP when the entry is inserted in the print queue and can be modified by the *CE input message once the entry is in the print queue.
2. If the entry is the result of an *ME input message, the current specifications (that is, the SAVE values, COPIES values, or both) are used to reconstruct the *ME input message for display. This reconstructed input message is enclosed in parentheses and follows the print queue identification number.
3. If the entry is not the result of an *ME input message but has been modified from the default value by the execution of a *CE input message, the *CE input message is reconstructed from the current specifications. The reconstructed input message is enclosed in parentheses and follows the print queue identification number.
4. If the entry has begun printing (that is, if the entry is the currently printing job or a job that was interrupted), the display includes the file name and, in parentheses, the page number where continuation might occur.

RJE Input Messages

During RJE initialization, the print queue is rebuilt asynchronously, thus allowing RJE to handle activities such as log on and job initiation. If an *SP request is made while the print queue is being rebuilt, the RJE response to the request displays the following extra line showing that the print queue list can be incomplete:

(PRINT Q REBUILD IN PROGRESS LIST MAY NOT BE COMPLETE.)

Examples

In the following examples, AUTOPRINT has a mix number of 200:

*SP

PRINT QUEUE
C 503
C 545.1(ME 545 COPIES=2 SAVE)
C 545.2(ME 545/563 SAVE)
#

*STATUS

#0200 AUTOPRINT/LSN038/"#0200" --FM REQD:CHECKS
#NO TASKS ACTIVE

*200FM

*SP

PRINT QUEUE
C 503 FILE=503/520/000CHECKS(22)
C 545.1(ME 545 COPIES=2 SAVE)
C 545.2(ME 545/563 SAVE)
C 500.1(ME 500 COPIES=5) FILE=501/000LINE(20) COPY=3
#

SS*Syntax**

```
-- * -- SS -----<text>--|  
      |         |  
      |-<LSN>-|
```

Explanation

The *SS (Send to Station) input message is used to communicate with the main system ODT or with another RJE terminal. When the <LSN> portion of the input message is omitted, the text is displayed at the main system ODT. When the <LSN> is present, the <text> is sent to the terminal that contains a station with the given <LSN>. If the station is not currently active, RJE displays the following message at the sending RSC:

#INACTIVE STATION.

RJE indicates an invalid <LSN> by displaying the following message:

#UNKNOWN STATION.

RJE displays a "#" at the sending RSC to indicate successful communication.

Example

When the first statement in the following example is executed at station 50, the second statement is displayed at station 53.

*SS 53 BOM DIA

SS FROM 50: BOM DIA

STATUS*Syntax**

```

-- * -- STATUS -----|
                    |
                    |-<LSN>-----|
                    |
                    |-<station name>-|

```

<station name>

```

    |<- /13\--- / --|
    |                |
----<identifier>----|

```

Explanation

The *STATUS input message displays the mix numbers of the WFL compiler, the AUTOPRINT or AUTOPUNCH job currently servicing the terminal (if no further text follows the input message), or both.

The <station name> is a unique identifier chosen by the installation for each station that is a member of the network. Station names in NDL/NDLII follow the same syntactic conventions as file titles within the system because any station can be assigned to a REMOTE file.

RJE REFERENCE MANUAL

When a datacomm station is specified by use of an <LSN> or <station name>, the current status of the station is displayed in the same format as that displayed by the CANDE "?STATUS" input message. The following mnemonics are used to indicate the station status:

Mnemonic -----	Meaning -----
RDY or UNRDY	Station is ready or not ready.
ENAB or DISABL	Station is enabled or not enabled for input.
ATT or UNATT	Station is attached or unattached to an MCS.
SW=CONN	Line is switched and connected.
SW=DISCON	Line is switched and disconnected.

Examples

*STATUS 4

RJE2(4) = 0:22:0 RDY ENAB ATT [SYSTEM/RJE]

In the preceding example, the station with LSN 4 is named "RJE2", is on DCP 0, and is station 0 of line 22. The station is ready, enabled, and attached to SYSTEM/RJE.

* STATUS

NO ACTIVE WFL TASK.
AUTOPRINT NOT RUNNING
AUTOPUNCH NOT RUNNING

TF*Syntax**

```
-- * -- TF --|
```

Explanation

The *TF (Tell Factors) input message yields a response indicating the current setting of the line-transmission factors for the terminal. The line-transmission factors are BLKSZ (characters per transmission blocking factor), BUFSZ (buffer size, in characters, of remote printer output, punch output, or both) and FTBLK (maximum number of characters allowed in a file transfer block). Refer to "*SF" in this section for more information on these line-transmission factors.

Example

```
*TF
```

```
# BLKSZ = 400
```

```
BUFSZ = 820
```

```
FTBLK = 1500
```

*TO

Syntax

-- * -- TO --|

Explanation

The *TO (Tell Options) input message yields a response indicating the current setting of the five run-time terminal options. Refer to "**SO" in this section for a discussion of these options.

Example

*TO

REMOTEPUNCH	RESET
CALLBACK	RESET
AUTOBACKUP	SET
IGNOREFM	RESET
CONTRBACKUP	SET

RJE Input Messages

*US

Syntax

-- * -- US --|

Explanation

The *US (USers) input message yields a response indicating the LSN and station name of every active and inactive remote terminal under the control of RJE. The terminal from which the keyin was received is indicated by a ">"; the LSNs of the devices of this terminal are also given along with this indication.

Example

*US

[065] DUMMYRJE.

[053] TD1800.

[053] RSC

WM*Syntax**

-- * -- WM --|

Explanation

The *WM (What MCS) input message yields a response indicating the identification of the current RJE MCS which contains the MCS name, host system number, host name, level of the software, mix number of the MCS, and MCS number. If RJE was compiled with the compile-time option "RAID" set, then "(RAID)" appears after the software level. Refer to "RJE Compile-Time Options" in the "RJE Compilation" section.

5 RJE CONTROL MESSAGES

INTRODUCTION

The activity of an active RJE MCS can be interrogated or controlled in two ways:

1. From the main system Operator Display Terminal (ODT), using the ODT "SM" command. This message has the following syntax:

```
--<RJE MCS mix number>-- SM -----<control message>--|
                                     |       |
                                     |-  :  -|
```

Refer to "SM" in the "ODT Commands" section of the "Operator Display Terminal (ODT) Reference Manual" for details on the use of this message.

2. From a Remote Supervisory Console (RSC) or a non-RJE terminal attached to RJE using the RJE input message *SM. This input message is valid only if the RSC or SPO option is set for the terminal or if the station was declared in Network Definition Language (NDL) with "SPO=TRUE". The syntax and semantics of the *SM input message is found under "*SM" in the "RJE Input Messages" section. "RSC" and "SPO" are described in this section.

Examples

The following example illustrates the use of the ODT SM command. In this example, the RJE Message Control System (MCS) executes at mix number 1234.

```
1234 SM: SAVE 53
```

After this SM command has been entered, the RJE SAVE control command is executed. RJE displays "#OK" at the RSC when the SM command has been successfully serviced. Refer to "SAVE" in this section.

The following example illustrates the use of the RJE "**SM" input message to initiate execution of the same RJE SAVE command as in the preceding example. The RJE response returns to the same terminal that keyed in the *SM input message.

*SM SAVE 53

The remainder of this section presents the forms and functions of the RJE control messages that can be executed through the RJE MCS.

RJE Control Messages

ABORT

Syntax

```

-- ABORT --<LSN>-- SEND -----|
                        |         |         | |
                        |- RECV -| |- = -----|
                        |         |         |
                        |-<integer>---|
                        |         |
                        |-<file name>-|

```

Explanation

The ABORT control message stops an active file transfer or deletes one or all of the entries that are queued for a host. The keywords "SEND" and "RECV" specify the type of transfer to be aborted. <LSN> is the logical station number (LSN) of the station to which the remote host is connected.

The second example under "FTS" in this section contains illustrations of the format and meaning of <integer> and <file name>.

Examples

The following message aborts the current active FILEX task (the sender):

```
1234 SM ABORT 20 SEND
```

The following message aborts the current active FILER task (the receiver):

```
1234 SM ABORT 20 RECV
```

The following message deletes all requests queued at this host for LSN 20:

```
1234 SM ABORT 20 SEND =
```

RJE REFERENCE MANUAL

The following message deletes all requests queued at the remote host for transmission to LSN 20:

1234 SM ABORT 20 RECV =

The following message deletes the fourth entry from the queued list but does not delete the active entry (entry 0 in the queue):

1234 SM ABORT 20 SEND 4

The following message deletes the fourth entry from the queued list of the remote host connected to LSN 20 but does not delete the active entry (entry 0 in the queue):

1234 SM ABORT 20 RECV 4

The following message deletes the first queued entry from the queued list for LSN 20 requested where the queued source file name matches <file name>:

1234 SM ABORT 20 SEND <file name>

The following message deletes the first queued entry from the queued list of the host that is using LSN 20, where the queued source file name matches <file name>:

1234 SM ABORT 20 RECV <file name>

RJE Control Messages

ATTACH

Syntax

```
-- ATTACH --<LSN>--|
```

Explanation

The ATTACH control message connects the specified <LSN> to RJE. If the ATTACH is successful, RJE responds with the following message:

```
#OK
```

However, if the station is not attached, RJE responds with the following message (where <int> designates the number of the DCWRITE error):

```
#DCWRITE ERROR # <int> DURING ATTACH OF LSN # <LSN>
```

Example

```
* SM ATTACH 34
```

BUG**Syntax**

```

-- BUG -----|
|             |
| - DUMP --<arrayname>--|
|             |
| - SO ---<option name>--|
|             |
| - RO -|
|             |
| - TO -----|

```

<option name>

```
-- FTSTBUG --|
```

Explanation

The BUG control message facilitates run-time control of MCS activity monitoring. BUG is valid only when the MCS is compiled with the RAID option set (refer to "RAID" under "RJE Compile-Time Options" in the "RJE Compilation" section).

The DUMP <arrayname> option causes the dumping to the printfile of a global array (specified by <arrayname>) used by RJE. Use of the DUMP <arrayname> option allows "snapshots" of the arrays used by RJE to be taken in real time.

The SO, RO, and TO options set, reset, and interrogate, respectively, the run-time BUG options. Currently, the only BUG option is FTSTBUG: this option causes all file-transfer records to be fully displayed on the RAID output, instead of truncating these records at ten words.

RJE Control Messages

Example

When the following statement is entered, the array specified by <arrayname> is dumped in HEX and ALPHA:

```
<RJE mix#> SM BUG DUMP <arrayname>
```

If <arrayname> does not exist, the following message is displayed:

```
NO SUCH ARRAY: <arrayname>
```

If the request is correct, the following message is displayed:

```
#OK
```

CLEAR**Syntax**

```
-- CLEAR -----<LSN>--|  
      |           |  
      |- VS -|
```

Explanation

The CLEAR control message clears all the stations on a line. This message performs the following actions:

1. Saves all stations on the line
2. Recalls all messages
3. Forces the line to go not ready
4. Discontinues any WFLTASK, AUTOBACKUP, or SERVICETASK (such as the use of the "*RS" input message) that is associated with the line
5. Resets all RJE control states
6. Logs off stations, giving the cause as "STATION CLEARED."
7. Updates the linkfile
8. Clears all virtual station information for the specified <LSN>

The "CL VS" version of this message causes a "psuedo-clear." When VS is specified, RJE resets all the tables for that station, but no attempt is made to communicate with any other host associated with the station. This version should be used only when both ends of the virtual connection are being monitored.

The stations on the line are left not ready and must be readied to be used.

Example

```
* SM CLEAR 51
```

RJE Control Messages

COPY

Syntax

```

-- COPY --<file name>----->
|                                     | | |
| -<usercode specification>-| | - BINARY -|
|
>----- FROM ----->
|
| - AS -----<file name>-----|
|
| - ONTO -| | -<usercode specification>-|
|
>-<volume specification>-- TO --<volume specification>-----|

<usercode specification>

-- ( -- USER -- = --<usercode>----->
|
>----- ) -----|
|
| - , -- PASSWORD -- = --<password>-|
|
| - / --<password>-----|

<volume specification>

----- ( ----->
|
| - DISK -----| |----- TAPE ----- , -|
|
| - PACK -----| | - KIND -- = -| | - TAPE7 --|
|
| -<volume name>-| | - TAPE9 --|
|
| | - PETAPE -|
|
| | - DISK ---|
|
| | - PACK ---|

>--- HOST ----- = --<host name>--- ) -----|
|
| - HOSTNAME -|

```

Explanation

The COPY control message transfers the file specified by <file name> from a source host to a destination host. Requests can be made to non-B 6000/B 7000 Series systems using System Communications Module (SYCOM). RJE syntax-checks only the part of the request involving the RJE host; the remainder of the request is forwarded as supplied by the user.

The BINARY option causes RJE to transmit the requested data (noncoded) file in an encoded fashion. This encoding is required in some cases when the requested transfer is between ASCII (B 800) and EBCDIC (B 1800 systems or B 6000/B 7000 Series systems) hosts because of differences in allowable characters. In transfers of data files between ASCII and EBCDIC hosts where the BINARY option is not used, all nongraphic characters are replaced by a graphic question mark (?). The BINARY option has no effect on the transfer of code files, as code files are always encoded between ASCII and EBCDIC hosts.

The COPY control message does not overwrite an existing file on the destination host unless the ONTO modifier is used.

The <usercode specification> verifies access rights to the specified file and to the use of the file transfer station and can also affect defaults for parts of the <file name>. For <file name>s that start with the characters "*" or "(", the <usercode specification> is not used as a prefix. However, the <usercode specification> is required for any source or destination that is a B 6000/B 7000 Series system host. There is no blank space between the <file name> and the <usercode specification>.

The default volume KIND is PACK. The <volume name> can be omitted from either the source part or the destination part of the request for non-B 6000/B 7000 Series systems; the affected host handles any defaults required for such a system.

The following error messages can result from the use of an invalid COPY command:

FILENAME GTR 100 CHAR.
INVALID FILENAME: <filename>
NO FROM OR TO PARTS.
NO FROM PART.
INVALID VOLUME NAME: <volume name>.
MISSING VOLUME NAME.
VOLUME NAME AND KIND MISMATCH.
MISSING EQUAL.

RJE Control Messages

INVALID MEDIA TYPE: <media type>.
 NO HOSTNAME.
 EXPECTING PARENTHESIS.
 NO TO PART.
 NO USERCODE/PASSWORD.
 INVALID USER/PASS SYNTAX.
 SOURCE AND DEST HOSTNAMES THE SAME.
 THIS HOST NOT SOURCE OR DEST.
 USERDATAFILE FROZEN - TRY LATER.
 SECURITY ERROR ON USER = <usercode>.
 FILE <file name> NOT AVAILABLE.
 FILE <file name> NOT RESIDENT.
 FILE <file name> ALREADY EXISTS.
 FILE <file name> IS OPEN EXCLUSIVE AND CANNOT BE REPLACED.
 FAMILY <family name> IS NOT PRESENT.

Examples

The following example transfers "(MIKE)TESTFILE" from a pack called "MCPMAST" on host B6700282 to a pack named "DISK" on host B68001004. Usercode MIKE (with no password) must be a valid usercode on both hosts.

```

1234 SM COPY TESTFILE (USER=MIKE) AS X (USER=RJE/RJE)
FROM MCPMAST (HOST=B6700282) TO DISK (HOST=B68001004)
  
```

The following example is the same as the first example, except that the destination file title is "(RJE)X ON DISK". Usercode MIKE is used for all security and resident checks on host B6700282, and "RJE/RJE" is used for these checks on host 68001004.

```

1234 SM COPY TESTFILE (USER=MIKE) AS X (USER=RJE/RJE)
FROM MCPMAST (HOST=B6700282) TO DISK (HOST=B68001004)
  
```

The following example transfers the system file "*WFL" from DISK on host B6700282 as a file called "(WHY)TEMP ON PACK" on host B7700003. (RJE overwrites this file if it already exists.)

```

1234 SM COPY *WFL (USER=MIKE) ONTO TEMP (USER=WHY,PASSWORD=ME)
FROM DISK (HOST=B6700282) TO PACK (HOST=B7700003)
  
```

The following example transfers the system file "*WFL" from MCPMAST on host "B6700282" to a B 1800 system with the host name of "B1800XX." The B 1800 uses whatever defaults it has defined for destination family.

```

1234 SM COPY *WFL (USER=MIKE) FROM MCPMAST (HOST=B6700282)
TO (HOST=B1800XX)
  
```

RJE REFERENCE MANUAL

The following two examples both cause syntax errors because of missing volume names. (Both hosts are B 6000/B 7000 Series systems.)

```
1234 SM COPY *WFL (USER=MIKE) FROM MCPMAST (HOST=B6700282)
TO (HOST=B6800135)
```

```
1234 SM COPY *WFL (USER=MIKE) FROM (HOST=B6700282)
TO PACK (HOST=B6800135)
```

RJE Control Messages

DP

Syntax

```
-- DP -----|  
      |               |  
      |-<program options>-|
```

Explanation

The DP (Dump) control message causes the MCS to take a program dump with the specified <program options> and to dump the current contents of the RJE-linked file to the line printer file. This message is valid only when the MCS has been compiled with the RAID option set. Refer to "RAID" under "RJE Compile-Time Options" in the "RJE Compilation" section. The DP control message has the same function as the RSC "**DP" input message (refer to "**DP" in the "RJE Input Messages" section).

Examples

- * SM DP
- * SM DP ARRAYS

FTS**Syntax**

```

-- FTS -----|
      |         |
      |--<LSN>-----|
      |         |
      | - LOCKQ ---|
      |         |
      | - UNLOCKQ -|

```

Explanation

The FTS (File Transfer Status) control message monitors file-transfer activity. This command without the optional <LSN> displays one or three lines for each active station attached to SYSTEM/RJE. If the station has no host name, or if no file transfer is active on the station, one line is displayed showing the LSN, station name, and host name (if any) along with the comment "NO ACTIVE FILE TRANSFER.". For stations with an active file transfer, three lines are displayed showing the status of the station and of the active file transfers.

If an <LSN> is specified, only the information for that station is displayed. In this case, the display is either one line or four or more lines, depending on the number of queued requests.

The modifiers "LOCKQ" and "UNLOCKQ" cause RJE to stop and start, respectively, the file-transfer send queue for the selected station. Once the queue is locked, RJE continues to queue new entries. The queue is also locked if the end-of-job (EOJ) modifier of the OFFLINE control message is specified; refer to "OFFLINE" in this section.

Examples

The following messages are displayed in response to the entry of the 79S control message with no <LSN> specification:

```

[034] RJE1 @ B6800282 NO ACTIVE FILE TRANSFER
[039] RJETIO NO HOSTNAME NO ACTIVE FILE TRANSFER
[044] RJEGMM @ B6700282 2 REQUEST QUEUED
      RECV: FILER ACTIVE (4321) 21 OF 54
      SEND: FILEX ACTIVE (4401) 1053 OF 10049 (PACING)

```

RJE Control Messages

The first line of the above example contains the following information:

Message -----	Meaning -----
[034]	Base LSN of the RJE station.
RJE1	Station name.
B6800282	Remote host name that is connected to this station.

The second line of the example indicates that the host or terminal using station RJETIO has not sent its host name (if it has one), and no file transfers are allowed.

The third, fourth, and fifth lines of the example indicate that the host "B6700282" is active on station "RJEGMM" and that a file transfer is running in each direction. The RECV line shows the status of the receiving task "FILER". The number in parentheses (4321) is the mix number of FILER, and "21 OF 54" indicates that 21 records of the 54 total records in the file have been transferred.

The SEND line shows the status of the sending task "FILEX". The number in parentheses (4401) is the mix number of FILEX, and "1053 OF 10049" indicates that 1053 records of the 10049 total records in the file have been transferred. The word "PACING" indicates that FILEX is waiting for a pacing flag before continuing with the next file transfer block of records.

The information in the following example is displayed when LSN 44 in the previous example is specified in the FTS control message:

```
[044] RJEGMM @ B6700282 2 REQUEST QUEUED
      RECV: FILER ACTIVE (4321) 21 OF 54
            <00> (MIKE)TESTFILE ON TESTPACK
              AS (MIKE)NEW/TESTFILE ON MCPMAST.
      SEND: FILEX ACTIVE (4401) 1053 OF 10046 (PACING)
            <00> (MIKE)RJEX ON MCPMAST.
            <01> *SYMBOL/WFL
              AS (MIKE)WFL ON TESTPACK.
            <02> (RJE)DUMMY ON PACK
              ONTO (MIKE)SAVE/THIS/FILE/FOREVER.
```

The lines that start with "[044]", "RECV:", and "SEND:" have the same meanings as in the previous example. "(MIKE)TESTFILE" and "(MIKE)RJE/X" are the file names associated with the active file transfers, and the counts displayed in the RECV and SEND lines refer to these file transfers.

RJE REFERENCE MANUAL

The lines that start with "<01>" and "<02>" are requests that have been queued. The "01" and "02" displayed within the broken brackets and the file names on those lines are examples of the <integer> and <file name> variables used as options in the ABORT control message. Refer to "ABORT" in this section.

RJE Control Messages

HEADLINE

Syntax

```
-- HEADLINE -----|
      |               |
      | -<text>-      |
      |               |
      | - + -----|
      |               |
      | - - -----|
```

Explanation

The HEADLINE control message controls and specifies text to be displayed as a headline at log on. Examples of this control message's syntax follow.

***SM HEADLINE**

This version of the control message displays the current setting of HEADLINE and any headline text.

***SM HEADLINE <text>**

This version of the control message causes the first 72 characters of <text> to be stored as the log on headline.

***SM HEADLINE +**

This version of the control message causes the headline text to be displayed between the RJE banner and the session number messages at the time of log on.

***SM HEADLINE -**

This version of the control message disables the headline text display at the time of log on, but does not change the text stored in the linkfile.

Examples

* SM HEADLINE

* SM HEAD +

RJE Control Messages

HELP

Syntax

-- HELP <RJE control message> --|

Explanation

The HELP control message helps the operator remember the syntax for control messages. The MCS responds to a HELP request by displaying a one-line diagram describing the syntax of the indicated message.

Examples

* SM HELP RELEASE

* SM HELP SS

HI**Syntax**

```
-- HI --|
```

Explanation

The HI control message closes the printer file, invokes the SYSTEM/BACKUP utility to print the printer file, and then reopens the printer file. Thus, MONITOR, DCERRFILE, and TASKFILE output can be printed while the MCS is still active. The HI control message is valid only when the MCS has been compiled with the RAID compile-time option set (refer to "RAID" under "RJE Compile-Time Options" in the "RJE Compilation" section).

Example

```
* SM HI
```

RJE Control Messages

LEVELS

Syntax

```
-- LEVELS --!
```

Explanation

The LEVELS control message displays the following information:

Message -----	Meaning -----
RJEPROTOCOLVERSION	The version of file-transfer and terminal-to-program protocols.
SYMBOLICHEADERLEVEL	The level of the symbolic header used in a file transfer.
LINKFILEVERSION	The version of the RJE Halt/Load recovery linkfile.
MAXTERMINALS	Compile-time define that controls the number of stations controlled by RJE.
MAXRJETERMINALS	Compile-time define that controls the number of stations controlled by RJE.
MAXNONRJETERMINALS	Compile-time define that controls the number of stations controlled by RJE.
MAXVIRTUALSTATIONS	Compile-time defines that control the number stations controlled by RJE.

Example

```
* SM LEVELS
```

```
RJEPROTOCOLVERSION=2,SYMBOLICHEADERLEVEL=2,LINKFILEVERSION=4  
MAXTERMINALS=20, MAXRJETERMINALS=10, MAXNONRJETERMINALS=10  
MAXVIRTUALSTATIONS=50
```

OFFLINE**Syntax**

```
-- OFFLINE ---<LSN>-----|
      |                   | |   |
      |-<station name>-| |- EOJ -|
```

Explanation

The OFFLINE control message terminates the datacomm connection between two host systems previously connected by execution of the ONLINE control message. (Refer to "ONLINE" in this section.)

The <station name> must be that of the base station (device address "00") in the RJE family. If an invalid LSN or station name is used, the following error message is displayed:

UNKNOWN STATION.

If no LSN or station name is supplied, the following error message is displayed:

LSN OR STATIONNAME REQUIRED.

The OFFLINE control message has different effects depending on the type of datacomm connection. If this connection is a switched line, OFFLINE causes log off and disconnects the line. If this connection is a direct or leased line, OFFLINE causes log off but leaves the line active.

If EOJ is specified, RJE completes the current file transfer (if one is active) and then terminates the session.

RJE responds to the OFFLINE command with the following message:

OK.

RJE Control Messages

Example

* SM OFFLINE GC

ONLINE**Syntax**

```
-- ONLINE ---<LSN>-----|  
      |                     |  
      |-<station name>-|
```

Explanation

The ONLINE control message initiates a connection between two hosts.

The <station name> must be that of the base station (device address "00") in the RJE family. If an invalid LSN or station name is specified, the following error message is displayed:

UNKNOWN STATION.

If no LSN or station name is supplied, the following error message is displayed:

LSN OR STATIONNAME REQUIRED.

The ONLINE message has different effects depending on the type of the datacomm connection. If this connection is a switched line without an Automatic Calling Unit (ACU), ONLINE has no effect. In this case, the following response is displayed:

NON DIALOUT CAPABLE STATION.

If this connection is a switched line with an ACU, ONLINE causes dial-out if a phone number is set up (refer to "**PH" in the "RJE Input Messages" section). If no phone number is set up, the following response is displayed:

#NO DIALOUT PHONE NUMBER

If a phone number is set up, the following response is displayed:

#DIALING OUT STARTED

RJE Control Messages

If the connection is a direct or leased line, ONLINE sends the station-id messages to initiate the connection. In this case, RJE displays the following message:

#OK

If the <LSN> is already connected and active, RJE displays the following message:

#STATION ALREADY ACTIVE.

Example

* SM ONLINE 60

PH**Syntax**

```

-- PH --<LSN>-----|
                    | - CLEAR -----|
                    |-<phone number>-|
                    | - INT -----|

```

Explanation

The PH control message displays, clears, changes, or retries the ACU phone number associated with a station. The semantics associated with use of PH are listed in the following paragraphs.

<RJE mix#> SM PH <LSN>

This message displays the current phone number (if any).

<RJE mix#> SM PH <LSN> CLEAR

This message clears the phone number.

<RJE mix#> SM PH <LSN> <phone number>

This message enters the specified new phone number.

<RJE mix#> SM PH <LSN> INT

This message causes dial-out retry if the CALLBACK option is set for the station specified by <LSN> (refer to "**SO" in the "RJE Input Messages" section).

RJE Control Messages

If the specified <phone number> contains more than 71 characters, the following error message is displayed:

#PHONE NUMBER GTR 71 CHARACTER

Example

* SM PH 123456

QUIT**Syntax**

-- QUIT --|

Explanation

The QUIT control message terminates the MCS and logs off all active terminals after displaying the message "#RJE QTED".

Example

* SM QUIT

RJE Control Messages

READY

Syntax

-- READY <LSN> --|

Explanation

The READY control message makes the terminal associated with the specified <LSN> ready. This control message negates the effect of the SAVE control message. (Refer to "SAVE" in this section.)

Example

* SM READY 53

RELEASE**Syntax**

```
-- RELEASE <LSN> ----- <MCS name> --|  
      |      |  
      |- TO -|
```

Explanation

The RELEASE control message releases the indicated <LSN> to the specified MCS. The specified MCS is activated if it is not already active. Failure to release the station is indicated by the display of one of the following messages:

INV. MCS.

DCWRITE ERR#<error number>.

Example

* SM RELEASE 118 TO SYSTEM/CANDE

RO**Syntax**

```
-- RO <LSN> --- ACCESSCODE ----|
|                                |
| - LOGON -----|
|                                |
| - STATIONID --|
|                                |
| - USER -----|
```

Explanation

The RO control message resets the indicated run-time option for the terminal associated with the indicated <LSN>. Unrecognized options are indicated by the following display message:

INV. OPTION

Refer to "SO" in this section.

The state of the run-time options can be inquired using the RJE "WHERE<LSN>" control message (refer to "WHERE" in this section for information about this control message).

Example

*SM RO 123 LOGON

RSC

Syntax

```
-- RSC -----|
      |         |
      |- - - -|
      |- + -|
```

Explanation

The RSC control message controls the use of the *SM message by RJE terminals with device address "01" in an RJE family of stations (RSCs). The same control for non-RJE terminals (for example, terminals transferred to RJE from other MCSs) can be achieved by using the SPO control message. Refer to "*SM" in the "RJE Input Messages" section and to "SPO" in this section.

If RSC is set (+), the affected terminals are able to use the *SM message regardless of the setting of the SPO NDL bit. If RSC is reset (-), the setting of the SPO NDL bit controls access to the *SM message. RSC without modification displays one of the following messages indicating the current setting of the RSC run-time option:

RSC IS SET

RSC IS RESET

An RSC compile-time dollar option is reset by default and has the same meaning as the RSC run-time option. Refer to "RJE Compile-Time Options" in the "RJE Compilation" section.

Examples

*SM RSC +

*SM RSC

RJE Control Messages

SAVE**Syntax**

-- SAVE <LSN> --!

Explanation

The **SAVE** control message makes the terminal associated with the specified <LSN> not ready. Any active terminal is logged off.

Example

*SM SA 14

SF**Syntax**

```

      |<-----|
      |
-- SF --<LSN>----- BLKSZ -----<integer>-----|
      |         | |
      |- BUFSZ -| |- = -|
      |         |
      |- FTBLK -|

```

Explanation

The SF control message specifies buffer sizes used by RJE for the terminal defined by <LSN>.

BLKSZ indicates the characters per transmission blocking factor (that is, the number of characters that can be shipped over the datacomm line per transmission).

BUFSZ indicates the buffer size, in characters, of remote printer output, punch output, or both (that is, the number of characters to be buffered in core when output is sent to the remote printer or punch).

FTBLK indicates the maximum number of characters allowed in an output file transfer block. This value should be the same on both host systems involved in a file transfer. If both hosts are B 6000/B 7000 Series systems, RJE allows the transfer of files whose MAXRECSIZES are greater than FTBLK by splitting the records across several blocks.

RJE Control Messages

The following defaults and limits are imposed:

Defaults		Limits
-----		-----
BLKSZ	400	132 through 1500 (inclusive)
BUFSZ	820	132 through 2000 (inclusive)
FTBLK	1500	400 through 2000 (inclusive)

NOTE

These values should be changed with the utmost care to avoid exceeding the limits of the remote terminal or of the datacomm line.

Examples

*SM SF 51 BLKSZ 500

*SM SF 60 FTBLK 2000

SO

Syntax

```

-- SO --<LSN>--- ACCESSCODE ----|
      |                         |
      |- LOGON -----|
      |                         |
      |- STATIONID --|
      |                         |
      |- USER -----|

```

Explanation

The SO control message sets the indicated run-time option for the terminal associated with the specified <LSN>. The state of the run-time options can be inquired about using the RJE "WHERE <LSN>" control message; these options have the following effects:

ACCESSCODE

If ACCESSCODE is set for a terminal, a default accesscode is required on all log ons with a default usercode. If the LOGON option is not set, ACCESSCODE is meaningless. The RJE compile-time option "ACCESSDEFAULT" is reset by default and has the same meaning as the run-time ACCESSCODE SO option. Refer to "RJE Compile-Time Options" in the "RJE Compilation" section and to "Log-on and Log-off Messages" in the "User Interface" section.

LOGON

If LOGON is set for a terminal, the terminal is secured; that is, no user can activate that terminal until a log-on sequence has been performed in which RJE is supplied with a valid usercode and password, and the usercode and password are then associated by default with all decks read at the terminal that do not contain a WFL "USER" control statement.

USER

If USER is set for a terminal, all job decks read at that terminal must contain a WFL "USER" control statement. The following message notifies the remote user that the card reader has been secured:

#CR SECURED.

RJE Control Messages

STATIONID

STATIONID can be set and reset in the same manner as the ACCESSCODE, LOGON, and USER options. If STATIONID is set for a terminal, a user cannot log on at that terminal until a valid RJE station name has been entered at the user's RSC. STATIONID is reset by default. Because the use of STATIONID involves possible datacomm reconfiguration, this option should be employed as sparingly as possible.

If STATIONID and LOGON are both set, the following request is added to the log-on sequence:

#AND YOUR STATION NAME.

If STATIONID is set and LOGON is reset, the user must satisfy the following request before being logged on by RJE:

#ENTER STATION NAME PLEASE

Each terminal that can call up RJE on a line must be assigned a unique station name. To facilitate this assignment, each such station must be described as a complete RJE terminal in the NDL description of the network. All lines bearing these terminals must be of dial-in/dial-out type with appropriate ACUs.

The RJE run-time option "STATIONID" allows the reconfiguration of RJE stations that are not assigned to a line in the NDL of the host system. The RJE compile-time defines "MAXTERMINALS" and "MAXRJETERMINALS" must be large enough to encompass the number of terminals placed under the control of this MCS. Refer to "Source RJE Defines" in the "RJE Compilation" section for discussions of these defines. For proper operation, STATIONID must be set for each of these stations, and these station names must be the only station names entered in response to a request during the log-on sequence. MAXTERMINALS must be large enough to handle all RJE stations declared in the NDL, regardless of line assignments.

If any of the terminals referenced are active when STATIONID is first set, these terminals are not logged off (as is the case with the LOGON option).

RJE REFERENCE MANUAL

When a user attempts to log on at a terminal for which STATIONID is set, RJE indicates that it has accepted the station name that was entered by displaying the following message (or the standard log-on message) at the user's RSC:

#RECONFIGURATION COMPLETED.

The preceding message is displayed if any datacomm reconfiguration was required. Any aborted reconfiguration attempts from which RJE was able to recover are noted by the display of appropriate messages at the RSC. (Compilation with the RAID option set provides additional aids; refer to "RJE Compile-Time Options" in the "RJE Compilation" section for a description of this option.)

RJE does not allow reconfiguration to a station that has logged off but still has an active AUTOBACKUP task. In this case, the following error message is displayed at the site that attempts to log on:

STATION IN USE, ENTER STATION NAME

A reconfigured RJE network can be examined using the "*US RSC" input message (refer to "*US" in the "RJE Input Messages" section).

If a station is erroneously left with no line assignment, the following message is displayed at the system ODT:

<LSN> : NOT ATTACHED.

Such a condition requires reinitialization of the Data Communications Processor (DCP).

Because of the pitfalls involved in reconfiguration, the RJE MCS should be compiled with the RAID compile-time option set for initial operation. Refer to "RAID" under "RJE Compile-Time Options" in the "RJE Compilation" section.

NOTE

Changing the status of the run-time options "STATIONID" or "USER" using the SM, SO, or RO control commands causes an update of the RJE linkfile.

Examples

*SM SO 53 ACCESSCODE

*SM SO 53 LOGON

SPO

Syntax

```

-- SPO -----|
      |         |
      |- - -|
      |         |
      |- + -|

```

Explanation

The SPO control message controls the use of the *SM input message by non-RJE terminals, for example, terminals transferred to RJE from another MCS. The same control for RJE terminals (stations with device addresses of "01") can be achieved by using the RSC control message. Refer to "**SM" in the "RJE Input Messages" section and to "RSC" in this section.

If SPO is set (+), the affected terminals are able to use the *SM input message regardless of the setting of the SPO NDL bit. If SPO is reset (-), the setting of the SPO NDL bit controls access to the *SM input message. If SPO is entered unmodified, one of the following messages is displayed indicating the current setting of the SPO run-time option:

SPO IS SET

SPO IS RESET

The SPO compile-time dollar option is reset by default and has the same meaning as the SPO run-time option (refer to "RJE Compile-Time Options" in the "RJE Compilation" section).

Examples

*SM SPO +

*SM SPO

RJE Control Messages

SS**Syntax**

```
-- SS ---<LSN>---<text>---|
      |           |
      |- ALL -|
```

Explanation

The SS control message displays the specified <text> at the RSC of the terminal associated with the specified <LSN>. If ALL is specified, the <text> is displayed at all active terminals.

The <LSN> can be a station of another connected host system, in which case, the <text> of the message is prefixed by "# FROM <host name>:" before it is written to the RSC station of the host system. The <text> of messages from nonhost systems is prefixed with "#FROM SPO:", even if the *SM input message was entered at a station.

Examples

```
*SM SS 123 IS YOUR TASK IN A LOOP
```

```
*SM SS ALL DCP WILL BE STOPPED IN 5 MIN#
```

TF**Syntax**

-- **TF** --|

Explanation

The TF control message displays the current values of the characters-per-transmission blocking factor (BLKSZ); of the buffer size, in characters, of remote printer output, punch output, or both (BUFSZ); and the maximum number of characters allowed in a file transfer block (FTBLK) for all active stations. Refer to "SF" in this section for more detailed descriptions of these line-transmission factors.

Example

*SM TF

[082]	BLKSZ = 400	BUFSZ = 820	FTBLK = 1500
[067]	BLKSZ = 400	BUFSZ = 820	FTBLK = 1500
[033]	BLKSZ = 400	BUFSZ = 820	FTBLK = 1500

RJE Control Messages

VS

Syntax

```
-- VS -----!
      |         |
      |-<LSN>-|
```

Explanation

The VS control message displays the base LSN and summary information for RJE terminal transfer lines. To display all the virtual stations on an RJE line, the base <LSN> of that line must be specified.

Examples

*SM VS 84

```
[084] RJEXXX @ SYS1073 (3 TOTAL, 1 INUSE STATIONS)
      [089] INPUT STATION NOT CONNECTED
      [090] INPUT STATION NOT CONNECTED
      [091] OUTPUT STATION NOT CONNECTED
      [092] ON STATION CONNECTED TO REMOTE TD471 (MCS=1 [152])
```

*SM VS 124

```
[124] RJE1 @ B68001244 (2 TOTAL, 1 INUSE STATIONS)
      [130] INPUT STATION NOT CONNECTED
      [131] OUTPUT STATION CONNECTED TO TD426361 [199]
```

*SM VS 153

```
[153] RJE2 NO HOSTNAME (1 TOTAL, 0 INUSE STATIONS)
      [160] INPUT STATION NOT CONNECTED
```

In the preceding examples, all the numbers in brackets ([]) are LSNs. The identifiers "RJEXXX", "RJE1", and "RJE2" are the names of the stations with device addresses of "00" that are in control of a file transfer link. The identifiers "SYS1073" and "B68001244" are the host names of the systems to which the file transfer links are connected. The remaining lines show the virtual stations along with their status (CONNECTED, NOT CONNECTED, or OUT OF SERVICE) and type (INPUT or OUTPUT).

RJE REFERENCE MANUAL

In this example, LSN 91 is processing a *CT request and has not yet received a reply from a remote host, such as SYS1073. Virtual station LSN 99 is in use by station TD471 from host SYS456 and has been released to MCS number 1 using a psuedo-station, LSN 152. LSN 131, which is an output station, is currently being used by a station called "TD426361" at LSN 153. Station RJE2 is currently not connected to any remote host, as indicated by the "NO HOSTNAME" display.

WAIT**Syntax**

```
-- WAIT -----!  
      |         |  
      |- + -|  
      |         |  
      |- - -|
```

Explanation

The WAIT control message causes the MCS to remain active even if no terminals are currently active. By default, RJE goes to end-of-task (EOT) when all terminals are found to be inactive. The QUIT control message can be used to force the MCS to terminate. Refer to "QUIT" in this section.

WAIT displays the current setting of the WAIT run-time option; WAIT+ sets this option, and WAIT- resets this option.

The state of an "*SM WAIT" command is maintained over both Halt/Loads and termination of RJE by the QUIT control message. The WAIT state is stored in the linkfile (refer to "RJE Halt/Load Restore" in the "User Interface" section).

Examples

```
*SM WAIT +
```

```
*SM WAIT -
```

WHERE**Syntax**

```
-- WHERE -----|
      |           |
      |--<LSN>--|
```

Explanation

The WHERE control message displays the status (ACTIVE, INACTIVE, or SAVED) of all terminals. If an <LSN> is specified, the status, configuration, and run-time options of the terminal associated with that <LSN> are displayed. The abbreviations used in the display are listed and defined in the following paragraphs.

TTP

The station is able to support terminal-to-program connections (terminal transfer).

FTS[RS]

The station is capable of file transfer. The [RS] displays the status of the file-transfer initialization. The brackets are present only for readability purposes. "R" indicates that the 09 control message has been received from the other host; "S" indicates that the 09 control message has been sent to the other host.

TERM

The station is acting as a terminal.

HOST

The station is acting as a host.

VER=<n>

The protocol version number is specified by <n>.

RJE Control Messages

Examples

*SM WH

[163] INACTIVE RJEUIO
[028] ACTIVE RJEIIB771
[089] ACTIVE RJE5457 @ MV4 (6900) (TTP, FTS[RS], HOST,
VER=2)
[053] ACTIVE TD1853T3 (TD830TERM) BY USERA

*SM WH 89

[089] RYESYS7
HOSTNAME = MV4
PROTOCOL (TTP, FTS, HOST, VER=2)
8 VIRTUAL STATIONS-1 INUSE
LOGON NOT REQUIRED
NO UC REQUIRED
NO ACCESSCODE REQUIRED
STATION ID NOT REQUIRED
NON-SWITCHED
ACTIVE
[089] DC1000
[090] RSC
[091] CARD
[092] PRINT
[093] FTS

*SM WH 53

[053] TD1853T3
UC = USERA
NO ACCESSCODE
LOGON REQUIRED
DEFAULT US IS USED
NO ACCESSCODE REQUIRED
NON-SWITCHED
ACTIVE
[053] DC1000
[053] RSC

WM**Syntax**

```
-- WM --|
```

Explanation

The WM (What MCS) control message displays the level of the MCS.

Example

```
*SM WM
```

```
#B6900 SYSTEM/RJE SYSTEM # 7 HOSTNAME =MV4 32.0.67
```

6 MCP INTERFACE

INTERFACE CHARACTERISTICS

This section describes the interface between the RJE system and a host system.

The heart of the RJE/host interface is the expansion of the origination word "PATHCONTROL" in the task of a process. This word contains information concerning the origination of the task along with information describing the destination of any printer or punch backup. PATHCONTROL has the following format:

Field -----	Meaning -----
[47:24]	DESTCONTROLF
[45:06]	DESTMCSF
[39:16]	DESTINATIONUNITF
[39:01]	DESTISREMOTEF
[38:15]	DESTUNITF
[23:24]	ORGCONTROLF
[21:06]	ORGMCSF
[15:16]	ORGINALUNITF
[15:01]	ORGISREMOTEF
[14:15]	ORGUNITF

PATHCONTROL is divided into two parts. The high-order 24 bits of this word describe the backup destination, and the low-order 24 bits describe the origin of the task. Because a task originating from a remote station has a unit number that is actually a logical station number (LSN), 16 bits are allocated to the description of unit numbers. To differentiate site unit numbers from LSNs, the top bits (that is, bits 15 and 39) are used, leaving a maximum of 15 bits for an LSN.

In addition to the LSN information, the DESTMCSF field is provided to specify the number of the Message Control System (MCS) controlling that LSN. This MCS number cannot exceed 47, even though the fields in PATHCONTROL allow a maximum value of 63. The reason for this restriction is explained under "Backup" in this section.

PATHCONTROL Task Attributes

A number of task attributes are available to set up PATHCONTROL.

DESTNAME

DESTNAME is a pointer that can be set either to any station name defined in the Network Definition Language (NDL) or to the word "SITE.". If DESTNAME is set to a station name, the NDL description is interrogated and the destination LSN (DESTUNITF) and currently controlling MCS number (DESTMCSF) are set in PATHCONTROL. If DESTNAME is set to SITE, then the destination control portion of PATHCONTROL (DESTCONTROLF) is set to zero.

DESTNAME can also be read, in which case, it returns the station name associated with the destination unit. If DESTNAME is interrogated and a remote destination has not been specified, the string "SITE." is returned.

DESTSTATION

DESTSTATION is a real-valued attribute that sets or returns the destination station (DESTUNITF). DESTSTATION can be set by any program: if it is set, the destination MCS number (DESTMCSF) is set using the number associated with the currently controlling MCS.

SOURCESTATION

SOURCESTATION is an integer-valued attribute that sets or returns the origination station (ORGUNITF). SOURCESTATION can only be set by an MCS (refer to "DESTSTATION").

SOURCEKIND

SOURCEKIND is an integer-valued attribute that returns the unit type associated with the originating unit (for example, CARDREADER = 9, REMOTE = 3, SPO = 2).

MCP Interface

BACKUPDESTINATION

BACKUPDESTINATION works in the same way as DESTNAME. When set at the job level, BACKUPDESTINATION applies to all subtasks unless overridden.

Examples

In the following example, the job "SITEJOB" is initiated from the main site and directs backup from its two subtasks to the indicated stations, which can or cannot be under the control of the same MCS.

```
<I> JOB SITEJOB;  
      BEGIN  
      RUN X; BACKUPDESTINATION = STA1;  
      RUN Y; BACKUPDESTINATION = STA2;  
  
<I> END JOB
```

In the following example, the job "RJEJOB" is initiated from a remote entry station and directs the backup from the first task to the main site. The backup for the second task is sent back to the remote station by default.

```
<I> JOB RJEJOB;  
      BEGIN  
      RUN X; BACKUPDESTINATION = SITE;  
      RUN Y;  
  
<I> END JOB
```

ODT REQUESTS

All ODT requests from a remote station are directed to the system CONTROLLER along with the origination LSN number and usercode, if present. When requests are handled from a remote site, only commands that are marked FREE in SYSTEM/SCTABLEGEN are honored.

The value of "FREE" is the default with the word "SITE" imposing the restriction. These two words can be set either at the section level or on the specific word. The example at the end of this subsection illustrates how the input to the table generation program can be set up.

SYMBOL/SCTABLEGEN, the input to SYSTEM/SCTABLEGEN, contains definitions of the default values. After changing the SCTABLE, the CONTROLLER bound in the Master Control Program (MCP) must be recompiled with the patches

RJE REFERENCE MANUAL

generated by SYSTEM/SCTABLEGEN. Thus, by appropriate use of these attributes, an installation can give a remote input station the exact degree of control desired. If a request is denied because the command is marked "SITE", the error message "NOT ALLOWED" is given.

If a request is honored, it is further restricted by the originating <LSN number> to tasks that have the same <LSN number>. Thus, a MIX request only shows jobs and tasks that originated from that <LSN> (the LSN of the remote RJE terminal). This restriction also applies to such requests as COMPLETED, WAITING, SCHEDULED, and MESSAGES. Any attempt to act on a job or task that did not originate from the appropriate LSN gives the error message "INVALID NUMBER.". Therefore, the RJE user is unaware of other users of the system.

The formats of Operator Display Terminal (ODT) requests are given in the "Operator Display Terminal (ODT) Reference Manual". All replies are formatted exactly as they are formatted at the central site.

For jobs and tasks initiated from a remote site, a backslash (\) is used to separate job and task numbers; this change was made so that the site operator could tell that the process originated from a remote station and that the user at the remote station can be handling any RSVP messages if the process is waiting. Thus, to the RJE user, the list of active items would appear as follows:

```
1234\1235 50 ALGOL A/B
```

The backslash character appears as a multiplication sign (x) on a Conrac or TD 800.

Example

```
UNIT SECTION SITE.  
PG CASE 0 VALUE 20,  
OL CASE 2 FREE,  
IV CASE 4 VALUE 62.
```

In this example, all requests in the section are marked to indicate that they are honored from the site console only. The request "OL", however, is marked "FREE"; thus, this request is honored from a remote station.

JOB DECKS

The RJE system allows any job deck to be entered from a remote station except a binary card file. A complete description of the Work Flow Language (WFL) used to write job decks is contained in the "Work Flow Language (WFL) Reference Manual."

The RJE system maintains a number of DCALGOL type queues for communications with the WFL compiler. Each queue is associated with a different active input terminal and a different copy of the WFL compiler. The RJE system starts the compiler using the following DCALGOL statement:

```
CONTROLCARD (Q[I], B) [WFLTASK[I]];
```

A one-to-one correspondence exists between the passed queue and the task variable associated with the process. The RJE MCS sets the appropriate task attribute to cause the compiler to run in a swap space if the swapping mechanism is enabled. The second parameter is a Boolean queue attribute which, if TRUE, causes the WFL compiler to expect a usercode to accompany all jobs.

The Boolean queue attribute, QREMOVEWAIT, if TRUE, causes a remove or an empty queue process to wait until a message is inserted. This attribute is assigned values as follows:

```
<queue-id>.QREMOVEWAIT := <Boolean expression>
```

If this attribute is set, a REMOVE on an empty queue functions differently from a HOLD in that, if the removing process is running in a swap space, that process is swapped out.

The WFL compiler performs remove operations on the passed queue. All data is in EBCDIC format; the WFL compiler makes necessary translations for all types but BINARY (because binary decks are not allowed and no RJE line convention exists for such decks).

The MCP informs the RJE system of all decks that are queued or discarded because of syntax errors or illegal queue assignments.

BACKUP

When a printer or punch backup file is opened, the PATHCONTROL in the task associated with the file is interrogated. If the destination in this word is specified as remote (DESTISREMOTEF), then the name of the file is "REMLPxx" or "REMCPxx" instead of "BD", where xx is the MCS number (DESTMCSF) from PATHCONTROL. For example, if job number 1234 produced printer output for MCS number 2, the backup name would be "REMLP02/0001234/...".

Word 3 of the first record in a backup file contains PATHCONTROL for the task owning the file. This information can then be used by the controlling MCS for any unit correspondence.

As backup is produced for a remote site, two bit maps are kept in the job stack that indicate which MCS receives print backup and punch backup. To make the manipulation of these maps convenient, they are each one word long; this is the reason for limiting the maximum MCS number to 47.

During job termination, the print map (REMPRINTMASK) is examined and for each bit that is set, the job formatter is invoked to produce a printer backup file whose external name is "SUMMARY". After this file is generated, a message is sent to the MCS as indicated by the bit map informing the MCS that printer backup has been produced and is now ready for output. The punch map (REMPUNCHMASK) is examined in a similar manner, and a corresponding notice is sent to the controlling MCS. The job formatter is not invoked for punch backup.

As many copies as necessary of the job summary listing are produced; thus, if a site job directs output to a remote station, or a remote job directs output to the site, a job summary is produced at both the site and the remote station.

The title of the summary file has the following form (where "xx" is the MCS number):

REMLPxx/<JOB #>/000SUMMARY

When the MCS receives the print notice, it first prints the summary file, then prints all remaining backup files. The summary file is formatted exactly as it would be at the central site. After all backup is printed for a job, the MCS prints "END" to indicate this condition.

MCP Interface

Example

Job 7569 has one task (7570) that produces a printer backup file called "LINE". The directory structure for MCS number 2 would appear as follows:

```
REMLP02
. 0007569
.. 0007570
... 000LINE
.. 000SUMMARY
```

INTERFACE MESSAGES

The RJE MCS, WFL compiler, and MCP interface through various DCALGOL queues. The following paragraphs describe the different formats for each type of interface message.

The first word of all interface messages has the following format:

```
[47:08] = Type (=21).
[39:08] = Variant.
[31:08] = ADDLINFO (type-dependent information).
[23:24] = LSN.
```

The variant field ([39:08]) of word 0 is used to differentiate the various messages.

WFL Card Image (Variant = 1)

This message is passed to the WFL compiler through a DCALGOL queue using the following DCALGOL statement:

```
CONTROLCARD (<queue>, <Boolean> [<task>]):
```

This message has the following format:

```
Word [0].[47:08] = 21.
      [39:08] = 1.
      [31:08] = Unused.
      [23:24] = LSN of remote terminal.
```

```
Word [1]          = Number of card images in the message.
```

RJE REFERENCE MANUAL

Word [2] - end = Card image text in EBCDIC with each card preceded by an 8-bit length byte. Bit [7:1] of this length character is set if the first character of the card is invalid. Bit [6:7] of the character contains the length, in characters, of the card image.

RJE Operator Request (Variant = 2)

This message and the following message are passed to the MCP through a DCALGOL queue using the following DCALGOL construct:

```
INSERT (<message>, <size>, INTERCOMQUEUES [0]);
```

INTERCOMQUEUES is a queue array reference. Before inserting a message into element 0 of INTERCOMQUEUES (the MCP input queue), the communications links must be established using the following DCALGOL construct:

```
SETUPINTERCOM (INTERCOMQUEUES, MYINPUTQ);
```

The SETUPINTERCOM statement allows an MCS to communicate with other MCSs or with the CONTROLLER. A message is sent to the MCS with number N by inserting a message in the queue array reference indexed by N (INTERCOMQUEUES). The MCP CONTROLLER implicitly has an MCS number of 0. Received messages are found in the queue specified by the <queue designator> (MYINPUT). After the SETUPINTERCOM statement is executed, INTERCOMQUEUES (N) gives a sending link to other MCSs (where "N" is the MCS number). MYINPUTQ receives messages from other MCSs when they insert messages into their output queue array reference indexed by the MCS number associated with MYINPUTQUEUE.

The RJE operator request message has the following format:

```
Word [0].[47:08] = 21.
      [39:08] = 2.
      [31:08] = Number of originating MCS.
      [23:09] = This field can be used by the sending MCS
                  for internal purposes. When a reply to an RJE
                  operator request message is sent, this field
                  included in the reply. Refer to "CONTROLLER
                  Reply (Variant = 3)".
      [14:15] = LSN of remote terminal.
```

MCP Interface

Word [1].[47:01] = 1 if the reply is to be truncated at line width.
 [46:01] = 0 if the user is to be restricted to these commands marked "FREE" in the input to SYSTEM/SCTABLEGEN. Refer to "ODT Requests" in this section.
 = 1 if the user can use any command. This bit could be set for a privileged user.
 [19:04] = 1, no response to message.
 = 2, concise response (that is, "OK").
 = 3, expanded response.
 [15:08] = Line width, where $2 < \text{line width} < 80$.
 [07:08] = Number of lines on page, where $0 < \text{lines} < \text{or} = 24$.

Word [2-4] = Usercode. If a usercode exists, then word [2].[46:7] is the length of the usercode to be applied to all print directories (PDs) and control cards received. If word [2].[47:1] = 1, then a validity check must be performed on the usercode being passed. If word [2].[47:8] = 0, then no usercode is used.

Word [5] = Length of input string, in characters.
 Word [6] - end = Input string.

CONTROLLER Reply (Variant = 3)

This message is received from the MCP CONTROLLER and has the following format:

Word [0].[47:08] = 21.
 [39:08] = 3.
 [31:08] = Number of originating MCS.
 [23:09] = This field is set from the input request. Refer to "RJE Operator Request (Variant = 2)".
 [14:15] = LSN of remote terminal.

In constructing this message, the MCS sets [31:32] from [31:32] of the input request message (variant=2).

Word [1] = Number of characters in message.
 Word [2] - end = Output string.

Next Message (Variant = 4)

This message follows a series of variant=3 messages if a NEXT condition exists. The MCS stores this message; when a NEXT is used to signal that the next page of output is desired, the MCS sends the variant=4 message back to the MCP. The variant=4 message has the following format:

Word [0].[47:08] = 21.
 [39:08] = 4.
 [31:32] = Set from word [0].[31:32] of the original
 variant=2 message.

Word [1] = Terminal information word. Refer to word [1]
 format under "RJE Operator Request [Variant=2]".

Word [2] - end = Contents set up by MCP.

Task Message (Variant = 5)

This message is generated by the MCP procedure "MESSER" when a message is generated for the computer operator and has the following format:

Word [0].[47:08] = 21.
 [39:08] = 5.
 [31:08] = MCS number.
 [23:24] = LSN of target remote terminal.

Word [1] = Date in binary Julian.

Word [2-3] = To be ignored (logging information) unless
 word [2].[47:01] = 1, in which case, a usercode
 appears after the message whose length is in
 word [2].[46:07].

Word [4] = Number of characters in message.

Word [5] - end = Message.

MCP Interface

Status Change (Variant = 6)

This message notifies an MCS of changes in the status of jobs or tasks initiated from a remote site.

Word [0].[47:08] = 21.
[39:08] = 6.
[31:08] = Subtype (described below).
[23:09] = 0.
[14:15] = LSN of target remote terminal.

Subtype = 1: WFL deck accepted by system.

Word [1] = Job number.

Word [2] = Job queue into which job was placed.

Subtype = 2: Backup ready for output.

Word [1] = Job number.

Word [2] = 1, printer backup. REMLPxx directory contains backup. The "xx" following REMLP is the MCS number.

= 2, punch backup. REMCPxx directory contains backup.

Unsolicited Message (Variant = 7)

This message results from actions of a task initiated from a remote source. The message format below is the same as that of the variant=3 message except for the format of word [0].[23:09].

Word [0].[47:08] = 21.
 [39:08] = 7.
 [31:08] = Number of MCS.
 [23:09] = 0.
 [14:15] = LSN of remote terminal.

Word [1].[47:01] = Usercode, present where the length is in word [1].[46:07]. The usercode, however, appears one word past the end of the message.

BOJ/BOT Message (Variant = 8)

This message notifies the controlling MCS of the beginning of jobs and tasks and has the following format:

Word [0].[47:08] = 21.
 [39:08] = 8.
 [31:08] = Number of MCS.
 [23:09] = 0.
 [14:15] = LSN.

Word [1] = Job serial word.
 [45:10] = Stack number.
 [31:16] = Job number.
 [15:16] = Task number. (If job number = task number, then task number refers to a job.)

Word [2] = Priority.

Word [3] = Not used.

Word [4, 5, 6] = Usercode.

Word [4].[47:08] = Length of name.

Word [7, 8, 9] = Compiler name.

Word [7].[47:08] = Length of name.

Word [10] - end = Name of job or task (in standard form).

Scheduled Message (Variant = 9)

This message notifies the MCS that a job has been scheduled to run. The variant=9 message has the following format:

Word [0].[47:08] = 21.

[39:08] = 9.

[31:08] = MCS number.

[23:24] = LSN of remote terminal.

Word [1] = Same as for variant=8 message.

Word [2] - [4] = Usercode, if word [2].[47:1] is set and the length of the usercode is in word [2].[46:7].

Restarted Message (Variant = 10)

This message notifies the MCS that a job is being restarted from the suspended state. (For example, the job may have been suspended as the result of operator action.) The format of this message is identical to the format of the variant=9 message, except that the variant field in this message equals 10.



7 RJE COMPILATION

RJE COMPILE-TIME OPTIONS

The RJE Message Control System (MCS) must be compiled from the SYMBOL/RJE symbolic with the DCALGOL compiler. Eleven compile-time options are provided to alter or add code to the resulting MCS. Nine of these options are reset by default in the released symbolic. The options are discussed in the following paragraphs; the default for each option is indicated in parentheses following the option name.

ACCESSDEFAULT (RESET)

If compiled with the ACCESSDEFAULT compile-time option set, RJE requires a default accesscode for logging on (refer to "RJE Log-on/Log-off" in the "User Interface" section and to "SO" in the "RJE Control Messages" section).

LINEINFO (SET)

If RJE is compiled with the LINEINFO compile-time option set, the Data Communications ALGOL (DCALGOL) compiler captures the sequence numbers of symbolic statements and associates these numbers with the generated object code. If the program terminates abnormally, the last three sequence numbers related to the last executed object code are associated with the fault-termination message.

NEWLINE (SET)

If RJE is compiled with the NEWLINE compile-time option set, the MCS is able to function properly when communicating with terminal operating systems produced after the DC1000 (for example, B 776 systems). Pre-DC1000 and DC1000 systems require NEWLINE to be reset.

NDLLOGIN (SET)

If RJE is compiled with the NDLLOGIN compile-time option set, the setting of the NDL LOGIN bit is used to control station log-off either with or without a USERCODE/PASSWORD. This option overrides the NOLOGON compile-time option.

NOLOGON (RESET)

If RJE is compiled with the NOLOGON compile-time option set, all terminals are allowed to log on without supplying RJE with a usercode and password. These terminals can "see" any nonsecured files on the system. Selective terminals can be secured (that is, can be required to supply a valid user identification when logging on) by using the "SM SO" control message to set the LOGON run-time option for those terminals (refer to "LOGON" under "SO" in the "RJE Control Messages" section).

PASS96COLCARDS (RESET)

If RJE is compiled with the PASS96COLCARDS compile-time option reset, all card images sent from RJE to the remote card punch are limited to 80 columns in length. If the option is set, the limit is 96 columns.

PASSLOWERCASE (RESET)

If RJE is compiled with the PASSLOWERCASE compile-time option set, RJE permits lowercase letters to be printed at remote terminals that are capable of lowercase-letter display.

RAID (RESET)

If RJE is compiled with the RAID compile-time option set, all activity of RJE stations is monitored on a printer file with the name PRINTFILE. Any results of a DCSYSTEMTABLES request for a DCWRITE error are also printed to the printer file. In addition, the *DL and *DP commands are enabled. Because additional disk is required when RAID is set, this option should be used sparingly and only when MCS errors are suspected.

RSC (RESET)

If RJE is compiled with the Remote Supervisory Console (RSC) compile-time option set, the *SM input message is allowed on all device-address "01" stations (RSCs) in the RJE families of stations (refer to "*SM" in the "RJE Input Messages" section and to "RSC" in the "RJE Control Messages" section).

SPO (RESET)

If RJE is compiled with the SPO compile-time option set, the *SM input message is allowed on all non-RJE terminals (for example, terminals transferred to RJE from another MCS). Refer to "*SM" in the "RJE Input Messages" section and to "SPO" in the "RJE Control Messages" section.

STATIONID (RESET)

If RJE is compiled with the STATIONID compile-time option set, terminals require STATIONID information at log-on time. (This option can be set for individual terminals using the SO control message; refer to "SO" in the "RJE Control Messages" section.)

USER (RESET)

If RJE is compiled with the USER compile-time option set, all card decks entered to RJE must include a Work Flow Language (WFL) user control card.

SOURCE RJE DEFINES

The user can be required to change a number of RJE defines to handle network configuration or to decrease the RJE overhead. These defines are listed and described in the following paragraphs.

MAXTERMINALS

This define must be set to a value that is at least equal to the number of RJE stations declared in the Network Definition Language (NDL) for the site. Declaration of a value much greater than the number of RJE stations causes increases in overhead and memory requirements for RJE. MAXTERMINALS is the sum of MAXNONRJETERMINALS and MAXRJETERMINALS.

MAXNONRJETERMINALS

This define specifies the maximum number of non-RJE terminals allowed at any time. A non-RJE terminal is a terminal whose NDL TERMINALTYPE identifier does not start with the letters "RJE" (for example, TD 800s and TELETYPEs). These terminals have usually been released to RJE from another MCS and do not belong to an RJE family of stations (PROCESSOR RSC, CARDREADER, LINEPRINTER, or FTS).

MAXRJETERMINALS

This define specifies the maximum number of RJE terminals allowed at any time. RJE terminals are terminals that belong to an RJE family of stations (PROCESSOR, RSC, CARDREADER, LINEPRINTER, or FTS).

MAXVIRTUALSTATIONS

This define specifies the maximum number of virtual stations declared for the MCS in the NDL for the site. If the number declared in the NDL is greater than MAXVIRTUALSTATIONS, RJE aborts at the time of initialization.

COMPILING THE RJE MCS

The following cards represent a typical deck used to compile SYSTEM/RJE:

```
<I>BEGIN JOB RJEcompilation;  
<I>COMPILE SYSTEM/RJE DCALGOL LIBRARY  
<I>DCALGOL FILE TAPE(TITLE=SYMBOL/RJE)  
<I>EBCDIC  
      (other $ cards and patch cards go here)  
<I>END JOB
```

A SAMPLE RJE SESSIONS

INTRODUCTION

Two examples appear in this appendix. The first example shows a typical RJE session using a B 771 terminal. In this example, a number of programs are run, and backup files are printed on the B 771 printer under the control of the Remote Supervisory Console (RSC) operator.

The second example shows a Command AND Edit (CANDE) language terminal that is attached to RJE and connected to another host. A code file is transferred from the local host to the remote host and then executed in the remote host.

The appendix titled "NDL/NDLII Definitions" contains the Network Definition Language (NDL) and Network Definition Language II (NDLII) declarations for these examples.

B 771 EXAMPLE

In this example, messages that start with a period (.) are B 771 firmware input/output messages. Although this example constitutes a full RJE session, a text paragraph precedes each message as explanation.

The messages preceded by "->" are operator input messages.

The B 771 system is first placed on-line, and a new RJE session is initiated.

```
-> .ONLINE
.HOST EST
-> HELLO
B6800 SYSTEM/RJE SYSTEM #456 HOSTNAME = SYS456 32.0.67 MIX = 7564.
.CR-NR
RJEIIB771 LOGGED ON AT 13:21:25   07/01/81.
SESSION 7885.
```

A check is made to see if the files are present using the PD (Print Directory) command.

```
-> PD (FS)=
(FS) (DIRECTORY)
. PROGRAMA (ALGOLCODE)
. PROGRAMB (ALGOLCODE)
```

RJE REFERENCE MANUAL

The state of the terminal options is interrogated using the *TO input message.

```
-> *TO
REMOTE PUNCH RESET
CALLBACK RESET
AUTOBACKUP SET
IGNORE FM RESET
CONTBACKUP SET
```

PROGRAMA is executed, and the listing produced by this execution is automatically printed on the B 771 printer (because the AUTOBACKUP option is set).

```
-> RUN (FS)PROGRAMA
#JOB 7887 INSERTED: IN Q#00
7887/7887 BOJ 50 "?BEGIN JOB;"
7887/7888 BOT 50 (FS)PROGRAMA
7887/7888 EOT (FS)PROGRAMA
7887/7887 EOJ JOB ?BEGIN JOB;
7564/7889 BOT 85 AUTOPRINT/LSN023/"#7887"
7889 REMLP14/0007887/0007888/000PRINT REMOVED ON PACK PK103.
7889 REMLP14/0007887 REMOVED ON PACK PK103.
7564\7889 EOT AUTOPRINT/LSN023/#7887
```

No backup files are present.

```
-> *BACKUP
#NO BACKUP FILES.
#END BACKUP REQUEST.
```

The AUTOBACKUP option is reset; thus, no more automatic backup printing occurs.

```
-> *RO AUTOBACKUP
AUTOBACKUP RESET
```

PROGRAMB is run.

```
-> RUN(FS)PROGRAMB
#JOB 7898 INSERTED: IN Q#00
7898/7898 BOJ 50 "?BEGIN JOB;"
7898/7899 BOT 50 (FS)PROGRAMB
```

Sample RJE Sessions

The Operator Display Terminal (ODT) "A" message is entered; this message inquires only about active programs initiated by RJE.

```
-> A
-----1 ACTIVE ENTRY -----
2 7898\7899 50 (FS)PROGRAMB
```

PROGRAMB finishes. Because AUTOBACKUP is reset, no backup printing occurs.

```
7898\7899 EOT (FS)PROGRAMB
7898\7898 EOJ JOB ?BEGIN JOB;
```

PROGRAMA runs again.

```
-> RUN (FS) PROGRAMA
#JOB 7902 INSERTED: IN Q#00
7902/7902 BOJ 50 "?BEGIN JOB;"
7902/7903 BOT 50 (FS)PROGRAMA
7902\7903 EOT (FS) PROGRAMA
7902\7902 EOJ JOB ?BEGIN JOB;
```

The ODT "C" message is used to verify the completed tasks.

```
-> C
----- COMPLETE ENTRIES -----
*7902\7902 EOJ JOB ?BEGIN JOB;
*7902\7903 EOT (FS)PROGRAMA
*7898\7898 EOJ JOB ?BEGIN JOB;
*7898\7899 EOT (FS)PROGRAMB
*7564\7889 EOT AUTOPRINT/LSN023/#7887
*7887\7887 EOJ JOB ?BEGIN JOB;
*7887\7888 EOT (FS)PROGRAMA
```

The backup files created by PROGRAMA and PROGRAMB are verified. These files are kept under the directory "REMLP14" in this example (MCS = 14).

```
-> PD REMLP14/=ON PACK
REMLP14 (DIRECTORY)
. 0007898 (DIRECTORY)
... 0007899 (DIRECTORY)
... 000LINE (BACKUPDISK)
..000SUMMARY (BACKUPDISK)
.0007902 (DIRECTORY)
.. 0007903 (DIRECTORY)
... 000PRINT (BACKUPDISK)
.. 000SUMMARY (BACKUPDISK)
-> *BACKUP
PRINTER BACKUP
```

```
7898/7899/000LINE,1 PAGE
7902/7903/000PRINT,1 PAGE
#END .BACKUP REQUEST.
```

The RJE print queue is checked.

```
-> *SP
PRINT QUEUE
C 7898
C 7902
```

Two more entries are made in the print queue.

```
-> *ME 7902 COPIES=2 SAVE
7902.1 QUEUED(ME 7902 COPIES=2 SAVE)
-> *SP
PRINT QUEUE
C 7898
C 7902
C 7902.1(ME 7902 COPIES=2 SAVE)
#
-> *ME 7902/7903 SAVE
7902.2 QUEUED (ME 7902/7903 SAVE)
-> *SP
PRINT QUEUE
C 7898
C 7902
C 7902.1(ME 7902 COPIES =2 SAVE)
C 7902.2(ME 7902/7903 SAVE)
```

An entry is changed in the print queue.

```
-> *CE 7902.2 COPIES=3
C 7902.2(ME 7902/7903 COPIES=3 SAVE)
-> *SP
PRINT QUEUE
C 7898
C 7902
C 7902.1(ME 7902 COPIES=2 SAVE)
C 7902.2(ME 7902/7903 COPIES=3 SAVE)
#
```

Sample RJE Sessions

The position of the entries in the print queue is changed.

```
-> *PB 7902.2
#
-> *SP
PRINT QUEUE
C 7902.2 (ME 7902/7903 COPIES=3 SAVE)
C 7898
C 7902
C 7902.1 (ME 7902 COPIES=2 SAVE)
```

Entries are deleted from the print queue.

```
-> *PB - 7902.2
#7902.2 DELETED
-> *PB - 7902.1
#7902.1 DELETED
-> *PB - 7902
#7902 DELETED
-> *SP
PRINT QUEUE
C 7898
```

Backup from job 7898 is printed at the main system printer.

```
*SB 7898
#
```

The session is terminated.

```
-> BYE
RJEIIB771 LOGGED OFF AT 13:27:28 07/01/81.
.HOST TERM
```

TERMINAL AND FILE TRANSFER EXAMPLE

In the following example, all operator input is indicated by "->". A text paragraph precedes each message as explanation.

```
-> ?WRU
#B6900:7 CANDE 32.341; YOU ARE DIABSTA1(18)
-> ?MCS SYSTEM/RJE
-> HELLO
B6900 SYSTEM/RJE SYSTEM #7 HOSTNAME = MV4 32.0.67 MIX = 4309.
DIABSTA1 LOGGED ON AT 10:22:54 06/26/81.
SESSION 4553.
```

The ODT "PD" message is entered. This message does not start with an asterisk (*). The linkfile FILEKIND is DATA.

```
-> PD SYSTEM/RJE/= ON DISK
SYSTEM (DIRECTORY)
. RJE (DCALGOLCODE) & (DIRECTORY) IN USE
. . LINKFILE (DATA) IN USE
```

*WM and *TF are RJE input messages (as indicated by the "*" preceding each message).

```
-> *WM
#B6900 SYSTEM/RJE SYSTEM #7 HOSTNAME = MV4 32.0.67 MIX = 4309. MCS
01.

-> *TF
#BLKSZ = 400  BUFSZ = 820  FTBLK = 1500
```

WH is an RJE control message, as indicated by the *SM input message preceding the control message. The SPO option is set, allowing this terminal to enter control commands. The connection to SYS456 (a B 6900) is inactive (LSN 68).

```
-> *SM WH
[083] ACTIVE RJ2TOSYS6 @ MV (6900) (TTP. FTS[S], HOST. VER=2)
[068] INACTIVE RJETOSYS456
[018] ACTIVE DIABSTA1 (TTYTERMDIAB)
[054] ACTIVE TD185T3 (TD830TERM)
```

Because LOGON is reset, a usercode is not required.

```
-> *SM WH 18
[018] DIABSTA1
LOGON NOT REQUIRED
```

Sample RJE Sessions

NO UC REQUIRED
 NO ACCESSCODE REQUIRED
 STATION ID NOT REQUIRED
 DIALIN
 ACTIVE
 [018] DC100C
 [018] RSC

No file transfer is taking place to SYS456 (LSN 68).

-> *SM FTS
 [083] RJ2TOSYS6 @ MV NO ACTIVE FILE TRANSFER

A connection is established with SYS456 (remote host).

-> *SM ONLINE 68
 #OK

-> *SM WH
 [083] ACTIVE RJ2TOSYS6 @ MV (6900) (TTP,FTS[S],HOST,VER=2)
 [068] ACTIVE RJETOSYS456 @ SYS456 (6800) (TTP,FTS[RS],HOST,VER=2)
 [018] ACTIVE DIABSTA1 (TTYTERMDIAB)
 [054] ACTIVE TD1853T3 (TD830TERM)

Eight virtual stations are present (two for input and six for output).
 The appendix titled "NDL/NDLII Definitions" contains an example of the
 NDL definitions for this connection.

-> *SM VS 68
 [068] RJETOSYS456 @ SYS456 (8 TOTAL, 0 INUSE STATIONS)
 [073] INPUT STATION NOT CONNECTED
 [074] INPUT STATION NOT CONNECTED
 [075] OUTPUT STATION NOT CONNECTED
 [076] OUTPUT STATION NOT CONNECTED
 [077] OUTPUT STATION NOT CONNECTED
 [078] OUTPUT STATION NOT CONNECTED
 [079] OUTPUT STATION NOT CONNECTED
 [080] OUTPUT STATION NOT CONNECTED

Code file PROGA is copied to SYS456 as PROGRAMA.

-> *SM COPY PROGA(USER=FS) AS PROGRAMA (USER=FS)FROM
 TIOADMIN(HOST=MV4)TO DISK(HOST=SYS456)
 #COPY REQUEST VALID - WILL FORWARD
 #FILE (FS)PROGRAMA ON DISK ALREADY EXISTS

A copy of SYSTEM/COBOL is requested.

```
-> *SM COPY *SYSTEM/COBOL(USER=FS) AS C(USER=FS) FROM DISK
(HOST=MV4) TO DISK(HOST=SYS456)
#COPY REQUEST VALID - WILL FORWARD
#COPY REQUEST OK-ED OF (FS)C ON DISK
```

Forty segments of job 6695 have already been copied.

```
-> *SM FTS
[083] RJ2TOSYS6 @ MV NO ACTIVE FILE TRANSFER
[068] RJETOSYS456 @ SYS456
RECV: NOT ACTIVE
SEND: FILEX ACTIVE (4574) 40 OF 6695 (PACING)
```

The request is aborted.

```
-> *SM ABORT 68 SEND
#OK

-> *SM FTS
[083] RJ2TOSYS6 @ MV NO ACTIVE FILE TRANSFER
[068] RJETOSYS456 @ SYS456 NO ACTIVE FILE TRANSFER
```

The terminal is still attached to RJE in the local host (SYSTEM 7).

```
-> *WM
#B6900 SYSTEM/RJE SYSTEM #7 HOSTNAME = MV4 32.0.67 MIX = 4309.
MCS 01.
```

The terminal is transferred to the remote host (SYS456) and then attached to RJE in the remote host.

```
-> *CT SYS456
#
#SUCCESSFUL TERMINAL TRANSFER TO HOST SYS456

-> *WM
#B6800 SYSTEM/RJE SYSTEM #456 HOSTNAME = SYS456 33.0.89 (RAID)
MIX = 8999. MCS 14.
```

The remote host is a dual B 6800 system. The ODT "WM" message is used here.

```
-> WM
LOCAL 2 MCP: SYSTEM/MCP33104TC/FMLYINX002 33.104.1018
H/L UNIT: 203 BACKUP UNIT: 197
LOCAL 3 MCP: SYSTEM/MCP33104TC/FMLYINX002 33.104.1018
```

Sample RJE Sessions

H/L UNIT: 203 BACKUP UNIT: 197
COMPILED: 06/23/81 @ 18:09:17 (NEWP 33.102)
COMPILE TIME OPTIONS ARE:
TRACE DIAGNOSTICS EXPERIMENTAL
LINEINFO LOCKTRACE SWAPTRACE
H/L REASON: MANUAL
H/L TIME: FRIDAY JUN 26, 1981 (81177) 8:53 AM.
GROUP ID.: DEFAULT
HOSTNAME: SYS456
SYSTEM SERIAL NO: 456
CATALOG LEVEL: 0
NEXT MCP: NOT SPECIFIED

The connection line on SYS456 is LSN 89. The appendix titled "NDL/NDLII Definitions" contains the NDL declarations for this example.

-> *SM WH
[163] ACTIVE RJEUIO @ SYS2073 (6900) (TTP.FTS[RS],HOST,VER=2)
[127] INACTIVE RJESYS6
[108] INACTIVE RJESYS5
[089] ACTIVE RJESYS7 @ MV4 (6900) (TTP,FTS[RS],HOST,VER=2)
[033] INACTIVE RJEDIAL456
[028] ACTIVE RJEIIB771

-> *SM WH 89
[089] RJESYS7
HOSTNAME=MV4
PROTOCOL (TTP,FTS,HOST,VER=2)
8 VIRTUAL STATIONS - 1 INUSE
LOGON NOT REQUIRED
NO UC REQUIRED
NO ACCESSCODE REQUIRED
STATION ID NOT REQUIRED
NON-SWITCHED
ACTIVE
[089] DC1000
[090] RSC
[091] CARD
[092] PRINT
[093] FTS

RJE REFERENCE MANUAL

The terminal is attached to CANDE on the remote host.

-> *RE SYSTEM/CANDE

#B6800:456 CANDE
#RELEASE COMPLETED

-> HELLO FS.

#B6800:456 CANDE 33.103; YOU ARE PSEUDO6RJESYS6(145)
(6/25) DSGN RVW CNCLD;ARCH FILE PURGE TONIGHT; CLAIM TAPES;
EXTENDED PM
#SESSION 9335 10:43:33 06/26/81
#FAMILY TIOADMIN NOT PRESENT

The file transferred is on "DISK". The CANDE "FILES" command is used here.

-> FILES ON DISK
(FS) ON DISK
. PROGRAMA : ALGOLCODE
#

PROGRAMA is executed.

-> R \$PROGRAMA
#RUNNING 9347
#ET=1.9 PT=0.4 IO=0.5

The CANDE session is finished, and the terminal returns to RJE in the remote host.

-> BYE
#END SESSION 9335 ET=1:10.2 PT=0.6 IO=0.5
#USER = FS 10:44:44 06/26/81
#B6800 SYSTEM/RJE SYSTEM #456 HOSTNAME =SYS456 33.0.089 MIX =8999.
[145] RELEASE COMPLETED.

The terminal returns to the local host under the control of RJE.

-> *DT
#TERMINAL TRANSFER TO HOST SYSA456 HAS BEEN TERMINATED

-> *WM
#B6900 SYSTEM/RJE SYSTEM #7 HOSTNAME = MV4 32.0.67 MIX = 4309.
MCS 01.

Sample RJE Sessions

The RJE session in the local host is finished, and the terminal returns to CANDE in the local host.

-> *BYE

DIABSTAL LOGGED OFF AT 10:44:55 06/26/81.

#B6900:7 CANDE

#RELEASE COMPLETED

#ENTER USERCODE PLEASE

B ODT INPUT MESSAGES

INTRODUCTION

This appendix presents summaries of the Operator Display terminal (ODT) messages that are valid for use through RJE. These messages are not checked by the RJE Message Control System (MCS), and are sent directly to the MCP (refer to "ODT Input Messages" in the "User Interface" section). For detailed descriptions of these messages, refer to the Operator Display Terminal (ODT) Reference Manual.

BASIC CONSTRUCTS

The following basic constructs appear in syntactic variables in ODT message syntax diagrams:

<identifier>

```

|<-/16\-----|
|
-----<any alphanumeric character>-----
|
|
|<-/16\-----|
|
|
- " ---<any nonquote EBCDIC character>--- " -

```

<mix number>

--<number>--|

<number>

```
|<-----|
!          |
----/4\-<digit>----
```

<mix number list>

```

|<-----,-----|
|
-----<mix number>-----
|
|-----<mix number>-----|

```

<text>

```

| <-----|
|
----/25\-- <any EBCDIC character> ----

```

<device>

```

---- CP ----|
|
|- CR --|
|
|- DK --|
|
|- PK --|
|
|- LP --|
|
|- MT --|
|
|- MTP -|
|
|- PP --|
|
|- PR --|
|
|- SC --|

```

```

-- DC --|

```

The DC form of <device> is valid only for Message-Level Interface Port (MLIP) systems.

The following device synonyms are permitted:

```

CR  = READER
DK  = DISK
PK  = PACK
LP  = PRINTER
MT  = TAPE
MTP = PETAPE
SC  = SPO

```

<unit number>

A number greater than 0 and less than 256.

ODT Input Messages

<unit number list>

```

      |<-----,-----|
      |
----<unit number>-----|
      |
      | - - -<unit number>-|

```

<file name>

```

                                     |<-/11\--- / --|
                                     |
---- ( --<identifier>-- ) ---<identifier>-----|
      |
      |<-/13\--- / --|
      |
      |-----<identifier>-----|
      |
      | - * -|

```

<file title>

```

--<file name>-----|
      |
      | - ON --<family name>-|

```

<family index>

A base unit-relative integer between 1 and 255.

<family name>

```

----<identifier>----|
      |
      | - PACK -----|
      |
      | - DISK -----|

```

A "family" is a logical way to group mass-storage devices together so that these devices appear to function as one unit. A system-resource diskpack comprises a family named PACK. A named native-mode diskpack (with any continuation packs) comprises a family whose name is the family name. A file with KIND=DISK refers, by default, to the DISK family; a file with KIND=PACK refers to the family whose name is the family name (by default, PACK). File titles containing the suffix "ON" <family name> can be used to specify a family other than the default family.

<range>

```
-- <number> -----|
                |           |
                |- - - - <number> -|
```

ODT MESSAGES

The following valid ODT messages are listed alphabetically with corresponding syntax. A number of these ODT messages are valid only in the forms used for inquiry. The syntax diagrams show only the syntax that is valid for use with RJE.

A**Syntax**

```

-- A -----
|
| - ALL - | | | <-----
|
| |
| |-----/1\- SWAPPER -----
|
| |-----/1\- MCSNAME -----<MCS name>-----
| | |
| | |----- = -----
|
| |-----/1\- IN ----<subsystem id>-----
| |
| |----- ( <processor id list> ) -----

```

<processor id list>

```

| <-----
| |
| | <- . -|
|
|
|----- GLOBAL -----|
|
| - 1 -----|
|
| - 2 -----|
|
| - 3 -----|
|
| - 4 -----|

```

Explanation

The A (Active mix entries) message lists all active jobs and tasks initiated by RJE.

AX**Syntax**

```
--<mix number list>-- AX --<text>--|
```

Explanation

The AX (Accept) message passes the specified <text> to the program(s) specified in the <mix number list>.

C**Syntax**

```
-- C --|
```

Explanation

The C (Completed mix entries) message lists recently completed jobs and tasks initiated by RJE.

CS**Syntax**

```
-- CS --|
```

Explanation

The CS (Change Supervisor) message displays the "supervisor" program.

CU**Syntax**

```
----- CU --|  
|               |  
| -<mix number list> -|
```

Explanation

The CU (Core Usage) message obtains information regarding the core usage of the system or of the job(s) specified in the <mix number list>.

DBS**Syntax**

```
-- DBS -----|  
      |         |  
      |- ALL -|
```

Explanation

The DBS (Data Base Stack entries) message lists all active data base stacks.

DQ**Syntax**

```
-- DQ --|
```

Explanation

The DQ (Default Queue) message indicates which queue is the system default queue.

ODT Input Messages

DS

Syntax

```
--<mix number list>-- DS -----|
                               |-----|
                               |--<option list>--|
```

<option list>

```
|<----- , -----|
|-----|
|-----*-----|
|-----|
| - ALL -----|
| - NONE -----|
| - BASE -----|
| - ARRAYS -----|
| - CODE -----|
| - FILES -----|
| - DBS -----|
| - LIBRARIES -----|
| - PRIVATELIBRARIES -|
| - SIBS -----|
```

Explanation

The DS (DiScontinue) message terminates all programs associated with the given <mix number list> or removes these programs from the mix schedule or scheduling queue.

DUMP**Syntax**

```
--<mix number list>-- DUMP -----|
                                |-----|
                                |-<option list>-|
```

<option list>

```
|<----- , -----|
|-----|
| * -----|
|-----|
|- ALL -----|
|- NONE -----|
|- FAULT -----|
|- DSED -----|
|- BASE -----|
|- ARRAYS -----|
|- CODE -----|
|- FILES -----|
|- DBS -----|
|- LIBRARIES -----|
|- PRIVATELIBRARIES -|
|- SIBS -----|
```

Explanation

The DUMP message invokes the program dump procedure for the program(s) specified in the <mix number list>.

FA

Syntax

```

                                |<----- , -----|
                                |                     |
--<mix number list>-- FA ---<file attribute assignment>----|

```

Explanation

The FA (File Attribute) message changes any file attribute that can be set.

FORM

Syntax

```

-- FORM -- LP --<unit number>--|

```

Explanation

The FORM message displays the FORMMESSAGE associated with the printer specified by <unit number>.

FR

Syntax

```

--<mix number list>-- FR --|

```

Explanation

The FR (Final Reel) message specifies that the input tape reel just read by the job denoted by the mix number is the final reel of an unlabeled tape file.

HI**Syntax**

```
--<mix number list>-- HI -----|
                        |           |
                        | -<number> -|
```

Explanation

The HI message causes the EXCEPTIONEVENT of the running stack denoted by each mix number in the <mix number list> and sets the VALUE task attribute of the program.

HN**Syntax**

```
-- HN --|
```

Explanation

The HN (Host Name) message displays the current host name of the system.

IB**Syntax**

```
--<mix number>-- IB -----|  
                        |      |  
                        |-<number>-|
```

Explanation

The IB (Instruction Block) message displays the requested instruction for the job specified by <mix number>.

ID**Syntax**

```
-- ID --|
```

Explanation

The ID (Initialize Datacomm) message displays the current datacomm software in use by the system.

LJ

Syntax

```
--<mix number list>-- LJ --<text>--|
```

Explanation

The LJ (Log to Job) message enters the specified <text> in the job log for the job specified in the <mix number list>.

LL (B 5000/B 6000 Series Systems with MPX)

Syntax

```
-- LL --|
```

Explanation

The LL (Load Limit) message interrogates the load level contained in the threshold register of the specified multiplexor(s) (MPXs).

LOG

Syntax

```
-- LOG -----|  
      |         |  
      |-<log parameters>-|
```

Explanation

The LOG message initiates the SYSTEM/LOGANALYZER utility.

ML

Syntax

-- ML --|

Explanation

The ML (Mix Limit) message interrogates the current system mix limit.

MM

Syntax

-- MM --|

Explanation

The MM (Memory Module) message lists the ready, to-be-saved, and not-used memory modules.

MSG

Syntax

-- MSG --|

Explanation

The MSG (MeSsaGes) message displays the most recent messages returned by the system from jobs initiated by RJE.

MX

Syntax

```

-- MX -----
|
| - ALL - | | | <-----|
|
| | | |
| | | | /1\ - SWAPPER -----|
|
| | | | /1\ - MCSNAME -----<MCS name>-| |
| | | | | - = - |
| | | | /1\ - IN ---<subsystem id>-----|
| | | | | - ( <box id list> ) ---|

```

<box id list>

```

| <-----|
| | | |
| | | | <- , -|
|
|----- GLOBAL -----|
|
| - 1 -----|
|
| - 2 -----|
|
| - 3 -----|
|
| - 4 -----|

```

Explanation

The MX (MiX entries) message yields the same response as the ODT "J" message, except that display lines (RSVP and DISPLAY messages) are printed with each task. The response includes only jobs initiated by RJE.

NET**Syntax**

```
-- NETWORK --|
```

Explanation

The NET (NETwork) message interrogates the setting of the network initialization file.

NS**Syntax**

```
-- NS --|
```

or:

```
-- NEXT --|
```

Explanation

The NS (Next Screen) message brings up the next screen, if any, on a screen terminal.

OF

Syntax

```
--<mix number list>-- OF --|
```

Explanation

The OF (Optional File) message is entered in response to a NO FILE message if the file sought has the file attribute "OPTIONAL" set equal to TRUE.

OK

Syntax

```
--<mix number list>-- OK --|
```

Explanation

The OK (reactivate) message reactivates the suspended jobs whose mix numbers are specified in the <mix number list>.

OL

Syntax

```
      |<----- , -----|
      |                     |
-- OL ---<device>--<unit number list>----|
```

Explanation

The OL (label table) message displays the label table for the specified peripheral devices at the supervisory console from which the message was entered.

OP

Syntax

```

-- OP -----|
      |      |
      |-<option list>-|

<option list>

|<-----|
|      |
|-----<number>-----|
|      |
| - OPEN -----|
| - TERMINATE -----|
| - NOCHECK -----|
| - LPBDONLY -----|
| - AUTORM -----|
| - DIAGNOSTICS -----|
| - CDONLY -----|
| - AUTORECOVERY ----|
| - DUPSUPERVISOR ---|
| - DUPINTRINSICS ---|
| - AUTODC -----|
| - NODUMP -----|
| - CPBDONLY -----|
| - CRUNCH -----|
| - BACKUPBYJOBNR ---|
| - FULLTRANSLATION -|
| - NOFETCH -----|
| - RESOURCECHECK ---|
|      |

```

ODT Input Messages

- NOSUMMARY -----	
- DIRDEBUG -----	
- CATALOGING -----	
- NEWPERETRY -----	
- OKTIMEANDDATE ---	
- LOGPOSITIONING --	
- SERIALNUMBER ----	
- ARCHIVING -----	
- CONTROLOLDWFL ---	
- IORANGECHECK ----	
- SWAPALLJOBS -----	
- NORVRSPAPERTAPE -	
- DIAGNOSTICDUMP --	
- IODIAGNOSTICS ---	
- USECATDEFAULT ---	
- CATTEST -----	
- MCPTEST -----	

Explanation

The OP (OPtions) message displays the states of the specified system options (or, if no options are specified, of all system options).

OT**Syntax**

```
--<mix number>-- OT --<number>--|
```

Explanation

The OT (stack cell inspection) message displays a message on the console with the following format:

```
<stack number> STACK CELL <cell number>=<tag>  
<contents of cell in hexadecimal> <message>
```

ODT Input Messages

PD

Syntax

```

-- PD  -- = ----->
      |      | | |      | |
      | - - - | |-<number>-| | - ON --<family name>-|
      |      | | |      | |
      | -<file title>-----|
      |      | | |      | |
      | -<directory>-----|

      |<- /12\-- / --|
      |      |      |
      |>--<directory>----->

      |-----|
      |      | | |      | |
      | - / -- = -----|
      |      | | |      | | |
      |      | - - - | |-<number>-| | - ON --<family name>-|
      |      |      | | |      | |
      | - = -----|
      |      | | |      | |
      | - - -----|

```

Explanation

The PD (Print Directory) message displays lists of files contained in the system disk directory.

PR

Syntax

```
--<mix number list>-- PR --<number>--|
```

Explanation

The PR (PRiority) message alters the current priority of the indicated scheduled or executing job(s) in the mix to the value specified by <number> or alters a job waiting in a scheduling queue.

PV

Syntax

```
-- PV --- MT ---<serial number>--|  
|      |      |  
|- PK -|  
|      |  
|- DK -|
```

Explanation

The PV (Print Volume) message displays all the information that the volume library contains about the specified volume and volume family.

QF

Syntax

```
-- QF --<number>--|
```

Explanation

The QF (Queue Factors) message displays the current value of all attributes associated with the job queue specified by <number>.

QT

Syntax

```
--<mix number list>-- QT --|
```

Explanation

The QT (Quit) message terminates the printing or punching of a backup file.

RM

Syntax

```
--<mix number>-- RM --|
```

Explanation

The RM (ReMove) message is used in response to a DUP LIBRARY message to remove the old file.

ODT Input Messages

S

Syntax

```

-- S ----->
    |
    | -/1\ - ALL - |
    |
>-----|
    | |<-----| |
    | |
    | -/1\ - SWAPPER -----|
    |
    | -/1\ - MCSNAME -----<MCS name>-----|
    |                                     |
    |                                     | - = - |
    |
    | -/1\ - IN ----<subsystem id>-----|
    |                                     |
    | - ( <processor id list> ) - |

```

<processor id list>

```

    |<-----|
    | |
    | |<- , -| |
    | |
----- GLOBAL -----|
    |
    | - 1 -----|
    |
    | - 2 -----|
    |
    | - 3 -----|
    |
    | - 4 -----|

```

Explanation

The S (Scheduled mix entries) message displays a list of scheduled tasks.

SB**Syntax**

-- SB --|

Explanation

The SB (Substitute Backup) message interrogates the backup medium substitution.

SC**Syntax**

-- SC --|

Explanation

The SC (System Configuration) message displays the current system configuration.

SI**Syntax**

-- SI --|

Explanation

The SI (System Intrinsic) message displays the current system intrinsic.

SL**Syntax**

```
-- SL -----|  
      |         |  
      |-<function>-|
```

Explanation

The SL (System Library) message displays the functional names of specific libraries.

SP**Syntax**

```
-- SP --|
```

Explanation

The SP (Show Print queue) message shows which job files are waiting to be printed.

SQ**Syntax**

```

-- SQ -----|
      |-----|
      |-<number>-----|
      |               |
      |-<number>--|

```

Explanation

The SQ (Show Queue) message displays information regarding the jobs in the queue specified by <number>, or in all job queues if no <number> is specified.

SS**Syntax**

```

      |<----- , -----|
      |                     |
-- SS -----<identifier>-----<text>--|
      |-----|      | | |
      |-<number>-----| | : -|

```

Explanation

The SS (Send to Station) message sends a message from the supervisory console to the datacomm station(s) identified by the <identifier> (station name) or <number> (LSN).

ODT Input Messages

ST**Syntax**

--<mix number list>-- ST --|

Explanation

The ST (STop) message temporarily suspends the jobs specified in the <mix number list>.

SUPPRESS**Syntax**

```
--<mix number list>-- SUPPRESS -----|  
                                |   |  
                                |- - -|
```

Explanation

The SUPPRESS message prevents the RJE-initiated jobs specified in the <mix number list> from appearing in a display of the job mix when these jobs are active.

TD**Syntax**

```
-- TD --|
```

Explanation

The TD (Time and Date) message displays the current time and date for the system.

TERM

Syntax

```

-- TERM -----|
| |<-----| |
| |
|----- LINES ---<number>-----|
|
| - WIDTH -|
|
| - FIRST -|
|
| - TRUNCATE ----- TRUE ---|
|
| - MESSAGES -| | - FALSE --|
|
| - RESPONSE --- NONE -----|
|
|
| - CONCISE --|
|
| - EXPANDED -|
|
| - FULLPAGE --- TRUE -----|
|
| - FALSE -----|

```

Explanation

The TERM (TERMinal) message controls the format of all displays appearing at the terminal where the message is entered.

TF**Syntax**

-- TF --|

Explanation

The TF (Type Factors) message displays the current values of the four working set parameters.

THAW**Syntax**

--<mix number list>-- THAW --|

Explanation

The THAW message changes permanently frozen libraries to temporary libraries.

ODT Input Messages

TI

Syntax

```
--<mix number list>-- TI --|
```

Explanation

The TI (Times) message displays the current processor and input/output (I/O) times charged to the job(s) specified in <mix number list>, the READYQ time of the task(s), the Presence Bit (PBIT) time accounting and number of operations, and the elapsed time since the job(s) entered the mix. READYQ time indicates the time a job ready to be processed is in queue for the processor to become available.

UQ

Syntax

```
-- UQ --|
```

Explanation

The UQ (Unit Queue) message allows interrogation of assignments of peripherals to queue.

W**Syntax**

```

-- W ----->
    |
    | |<-----|
    | |<- /1\ - ALL -|
    |
    >-----|
    |
    | |<-----|
    | |
    | |----- /1\ - SWAPPER -----|
    |
    | |<- /1\ - MCSNAME -----<MCS name>-----|
    | |
    | |
    | |<- = -|
    |
    | |<- /1\ - IN ---<subsystem id>-----|
    | |
    | |<- ( <processor id list> ) -|

```

<processor id list>

```

    | |<-----|
    | |
    | |<- , -|
    |
    |----- GLOBAL -----|
    |
    | |<- 1 -----|
    | |
    | |<- 2 -----|
    | |
    | |<- 3 -----|
    | |
    | |<- 4 -----|

```

Explanation

The W (Waiting mix entries) message displays tasks that require operator action to continue (that is, tasks that are suspended on an RSVP condition).

ODT Input Messages

WM

Syntax

```
-- WM --|
```

Explanation

The WM (What MCP) message displays information regarding the current MCP.

WY

Syntax

```
--<mix number>--- WY ----|  
      |           |  
      |- Y  --|
```

Explanation

The WY (status interrogation) message displays the current status of the task specified by <mix number>.

C NDL/NDLII DEFINITIONS

This appendix shows examples of Network Definition Language (NDL) and Network Definition Language II (NDLII) definitions for RJE. Complete NDL and NDLII examples are contained in the SYMBOL/SOURCENDL and SYMBOL/SOURCENDLII files on the A Series system release tapes.

CONFIGURATION

In the examples, the NDL and NDLII declarations are shown for the following RJE configuration:

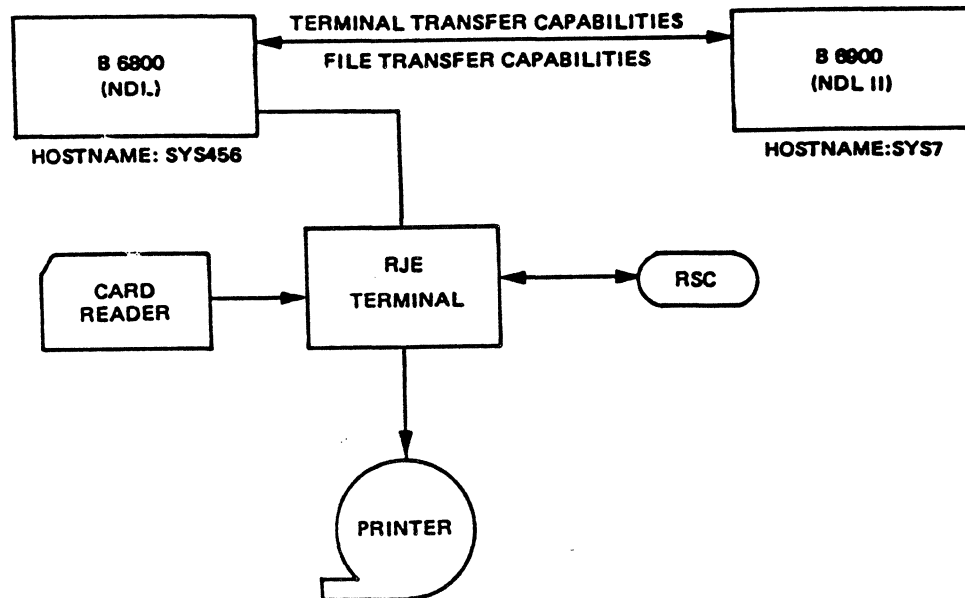


FIGURE C-1. RJE CONFIGURATION

In this configuration, a B 6800 system and a B 6900 system are connected with terminal-transfer and file-transfer capabilities. In addition, an RJE terminal with peripherals (B 771) is connected to the B 6800 system.

RJE NDL DEFINITIONS: B 6800 SYSTEM

The following paragraphs present the NDL definitions used for RJE on a Data Communications Processor (DCP) datacomm system (in this example, the B 6800 system).

Control and Request Procedures

The line control procedure used in this example is the standard RJE control (CONCENTRATE) found in the SYMBOL/SOURCENDL file.

The request procedures used are the standard RJE requests (READRJE and WRITERJE) found in the SYMBOL/SOURCENDL file.

Terminal Declarations

%***** GENERAL TERMINAL DEFAULTS *****%

TERMINAL DEFAULT TERMDEF:

CONTROL	=	CONTENTION.
CODE	=	ASC67.
BLOCK	=	FALSE.
SYNCS	=	FALSE.
DUPLEX	=	FALSE.
SCREEN	=	FALSE.
TURNAROUND	=	0.
ICTDELAY	=	0.
PAGE	=	NULL.
TRANSMISSION	=	NULL.
ADDRESS	=	NULL.

TERMINAL DEFAULT RJETERMDEF:

DEFAULT	=	TERMDEF.
CONTROL	=	CONCENTRATE.
SCREEN	=	TRUE.
ADDRESS	=	2.
WIDTH	=	420.
MAXOUTPUT	=	1500.
TIMEOUT	=	1500 MILLI.
TURNAROUND	=	40 MILLI.
ADAPTER	=	9.11,12,14,15,17,20,23.

NDL/NDLII Definitions

%***** RJE TERMINALS *****%

TERMINAL RJE:

DEFAULT = RJETERMDEF.
 PARITY = VERTICAL:EVEN,
 HORIZONTAL:EVEN.
 REQUEST = WRITERJE:TRANSMIT.
 READRJE:RECEIVE.

TERMINAL RJEAFTS:

DEFAULT = RJETERMDEF.
 PARITY = VERTICAL:EVEN,
 HORIZONTAL:EVEN.
 MAXOUTPUT = 2200.
 REQUEST = WRITERJE:TRANSMIT,
 READRJE:RECEIVE.

TERMINAL VSRJEA:

DEFAULT = RJETERMDEF.
 WIDTH = 80.
 PAGE = 24.
 MAXOUTPUT = 2200.
 MAXINPUT = 2200.
 ADDRESS = 2(DIFFERENT).
 PARITY = VERTICAL:EVEN,
 HORIZONTAL:EVEN.
 REQUEST = WRITERJE:TRANSMIT,
 READRJE:RECEIVE.

The terminal VSRJEA, whose name does not begin with the letters "RJE", has been declared for the virtual and pseudo-stations. Refer to "Terminal Transfer" in the "User Interface" section.

The RJE family of terminals are devices with addresses in the range "00" to "04", including Remote Supervisory Console (RSC) and LINEPRINTER. To distinguish the VSRJEA terminals from the RJE family of terminals, the RJE terminal names must start with the letters "RJE".

In this example, RJE and RJEAFTS are the RJE terminals.

Station Declarations

%***** GENERAL STATION DEFAULTS *****%

STATION DEFAULT STADEF:

ENABLEINPUT = TRUE.

\$

LOGICALACK = FALSE.

MYUSE = INPUT, OUTPUT.

STATION DEFAULT RJESTADEF:

DEFAULT = STADEF.

MCS = SYSTEM/RJE.

RETRY = 10.

CONTROL = QM.

STATION DEFAULT RJEASYDEF:

DEFAULT = RJESTADEF.

TERMINAL = RJE.

ADAPTER = 15.

%*****SYS456 RJE STATIONS FOR RJE TO B771 *****%

STATION RJEIIB771:

DEFAULT = RJEASYDEF.

ADDRESS = "00".

MCS = SYSTEM/RJE.

STATION RJEIIB771SC:

DEFAULT = RJEASYDEF.

ADDRESS = "01".

WIDTH = 72.

CONTROL = QM.

MCS = SYSTEM/RJE.

STATION RJEIIB771CR:

DEFAULT = RJEASYDEF.

ADDRESS = "02".

MCS = SYSTEM/RJE.

STATION RJEIIB771LP:

DEFAULT = RJEASYDEF.

ADDRESS = "03".

MCS = SYSTEM/RJE.

STATION RJEIIB771FTS:

DEFAULT = RJEASYDEF.

TERMINAL = RJEFTS.

ADDRESS = "04".

MCS = SYSTEM/RJE.

NDL/NDLII Definitions

%*****SYS456 RJE STATIONS FOR RJE TO SYS7*****%

STATION RJE SYS7:

DEFAULT	= RJEASYDEF.	
ADDRESS	= "00".	ADAPTER = 14. %4800 ASYC
MCS	= SYSTEM/RJE.	

STATION RJE SYS7SC:

DEFAULT	= RJEASYSDEF.	
ADDRESS	= "01".	ADAPTER = 14.
WIDTH	= 72.	
CONTROL	= QM.	
MCS	= SYSTEM/RJE.	

STATION RJE SYS7CR:

DEFAULT	= RJEASYDEF.	
ADDRESS	= "02".	ADAPTER = 14.
MCS	= SYSTEM/RJE.	

STATION RJE SYS7LP:

DEFAULT	= RJEASYDEF.	
ADDRESS	= "03".	ADAPTER = 14.
MCS	= SYSTEM/RJE.	

STATION RJE SYS7FTS:

DEFAULT	= RJEASYSDEF.	SPO = TRUE
ADDRESS	= "04".	TERMINAL = RJEFTS.
MCS	= SYSTEM/RJE.	ADAPTER = 14.

%*****SYS456 VIRTUAL STATIONS FOR TERMINAL TRANSFER TO SYS7*****%

STATION VSIN1RJESYS7:
DEFAULT=RJEASYDEF. TERMINAL=VSRJEA. SPO = TRUE.
ADDRESS=("aA","Aa"). MCS=SYSTEM/RJE. ADAPTER = 14.

STATION VSIN2RJESYS7:
DEFAULT = RJEASYDEF. TERMINAL=VSRJEA. SPO = TRUE.
ADDRESS=("bA","Ab"). MCS=SYSTEM/RJE. ADAPTER = 14.

STATION VSIN3RJESYS7:
DEFAULT=RJEASYDEF. TERMINAL=VSRJEA. SPO = TRUE.
ADDRESS ("cA","Ac") MCS=SYSTEM/RJE. ADAPTER = 14.

STATION VSIN4RJESYS7:
DEFAULT=RJEASYDEF. TERMINAL=VSRJEA. SPO = TRUE.
ADDRESS=("dA","Ad"). MCS=SYSTEM/RJE. ADAPTER = 14.

STATION VSIN5RJESYS7:
DEFAULT=RJEASYDEF. TERMINAL=VSRJEA. SPO = TRUE.
ADDRESS=("eA","Ae"). MCS=SYSTEM/RJE. ADAPTER = 14.

STATION VSIN6RJESYS7:
DEFAULT=RJEASYDEF. TERMINAL=VSRJEA. SPO = TRUE.
ADDRESS=("fA","Af"). MCS=SYSTEM/RJE. ADAPTER = 14.

STATION VSOUT1RJESYS7:
DEFAULT=RJEASYDEF. TERMINAL=VSRJEA. SPO = TRUE.
ADDRESS=("Aa","aA"). MCS=SYSTEM/RJE. ADAPTER = 14.

STATION VSOUT2RJESYS7:
DEFAULT=RJEASYDEF. TERMINAL=VSRJEA. SPO = TRUE.
ADDRESS=("Ab","bA"). MCS=SYSTEM/RJE. ADAPTER = 14.

%*****SYS456 PSEUDO STATIONS FOR TERMINAL TRANSFER TO SYS7*****%

STATION PSEUDO1RJESYS7:
DEFAULT=RJEASYDEF. TERMINAL=VSRJEA. SPO = TRUE. ADAPTER =14.
ADDRESS=("09","09"). MCS=SYSTEM/RJE. CONTROL = QM.

STATION PSEUDO2RJESYS7:
DEFAULT=RJEASYDEF. TERMINAL=VSRJEA. SPO = TRUE. ADAPTER =14.
ADDRESS=("09","09"). MCS=SYSTEM/RJE. CONTROL = QM.

STATION PSEUDO3RJESYS7:
DEFAULT=RJEASYDEF. TERMINAL=VSRJEA. SPO = TRUE. ADAPTER =14.
ADDRESS=("09","09"). MCS=SYSTEM/RJE. CONTROL = QM.

STATION PSEUDO4RJESYS7:
DEFAULT=RJEASYDEF. TERMINAL=VSRJEA. SPO = TRUE. ADAPTER =14.
ADDRESS=("09","09"). MCS=SYSTEM/RJE. CONTROL = QM.

NDL/NDLII Definitions

STATION PSEUDO5RJESYS7:

DEFAULT=RJEASYDEF. TERMINAL=VSRJEA. SPO = TRUE. ADAPTER =14.
 ADDRESS=("09","09") MCS=SYSTEM/RJE. CONTROL = QM.

STATION PSEUDO6RJESYS7:

DEFAULT=RJEASYDEF. TERMINAL=VSRJEA. SPO = TRUE. ADAPTER =14.
 ADDRESS=("09","09") MCS=SYSTEM/RJE. CONTROL = QM.

The complete RJE family (devices with addresses in the range "00" through "04") is declared for both the B 771 and the 4800-BPS line connecting SYS456 (the B 6800 system) to SYS7 (the B 6900 system).

Devices with addresses of "04" are used for file transfer (stations RJEIIB771FTS and RJESYS7FTS in this example).

Eight virtual stations (six for input [VSIN1RJESYS7 through VSIN6RJESYS7] and two for output [VSOUT1RJESYS7 and VSOUT2RJESYS7]) plus six pseudo-stations (address "09" [PSEUDO1RJESYS7 through PSEUDO6RJESYS7]) were declared for terminal transfer, allowing up to six terminals transferred from SYS7 (the B 6900 system) to be attached to Message Control Systems (MCSs) on SY456 (the B 6800 system).

Line Declarations

%LINE FOR B771

LINE L29:

ADDRESS = 2:1:13.
 ADAPTER = 5 (DIRECT).
 STATION = RJEIIB771,RJEIIB771SC,RJEIIB771CR,
 RJEIIB771LP,RJEIIB771FTS.

%LINE FOR RJE TO SYS7

LINE L36:

ADDRESS = 2:2:04.
 ADAPTER = 5 (DIRECT).
 STATION = RJESYS7,RJESYS7SC,RJESYS7CR,RJESYS7LP,
 RJESYSFTS,
 VSIN1RJESYS7,VSIN2RJESYS7,VSIN3RJESYS7,
 VSIN4RJESYS7,VSIN5RJESYS7,VSIN6RJESYS7,
 VSOUT1RJESYS7,VSOUT2RJESYS7,
 PSEUDO1RJESYS7,PSEUDO2RJESYS7,
 PSEUDO3RJESYS7,PSEUDO4RJESYS7,
 PSEUDO5RJESYS7,PSEUDO6RJESYS7.

All the stations declared for the SYS7 connection are on the same line, although this condition is not required for the pseudo-stations, which are part of a common pool available to any virtual station attached to RJE.

DCP Declaration

%***** DCP SECTION *****%

DCP 2:

EXCHANGE = 3.
MEMORY = 16384.
OPTIONS = LOCALTABLES, SECURED LINES, TIMESTAMP.
TERMINAL = TELETYPE, SPEEDSENSETTY, BSCDIDIRECT,
TD830, TD830E(MSGSPACE=6), TD820, TD800TERM.
SCREENITY, BDLCTERMINAL(MSGSPACE = 3),
RJEA.RJES,VSRJEA,VSRJES.
RJEAFTS(MSGSPACE = 3,MAXMSGSPACE = 20),
RJESFTS(MSGSPACE = 3,MAXMSGSPACE = 20),
MONITORA, MONITORS.

AUXILIARY = READPAPERTAPE. PUNCHPAPERTAPE.
READTELETYPE,WRITETELETYPE.
READRJE, WRITERJE,
RECEIVE2741,TRANSMIT2741.

NDL/NDLII Definitions

RJE NDLII DEFINITIONS: B 6900 SYSTEM

The following paragraphs present the NDLII definitions used for RJE on a Network Support Processor/Line Support Processor (NSP/LSP) datacomm system (in this example, a B 6900 system).

Editor and Algorithm

The editor used in this example is the standard RJE Editor (RJE) found in the SYMBOL/SOURCENDLII file. The algorithm used in this example is the standard RJE Algorithm (RJECONTROL) found in the SYMBOL/SOURCENDLII file.

Class Declaration

```
RJE4800CLASS          % FOR 4800 BAUD RJE
(MODE      = ASYNC;
CODE       = ASCII;
BITRATE    = 4800;
STOPBITS   = SHORT;
PARITY     = VERTICAL: EVEN, HORIZONTAL: CRC=X7+1,0,0),
```

As in the B 6800 system (SYS456) example, this line is an asynchronous line of 4800 BPS.

Terminal Declarations

```
%***** RJE TERMINAL AND STATION DEFAULTS *****%
```

```
DEFAULT TERMINAL RJETERMDEF:          % DEFAULT RJE TERMINAL
ADDRESSLENGTH = RECEIVE: 2, TRANSMIT: 2:
CLASS         = RJE4800CLASS;          % TDI, 4800 BAUD
DUPLEX        = FALSE;
SCREEN        = TRUE;
TYPE          = RJETYPE;
WRAPAROUND    = FALSE;
```

```
%***** RJE TERMINAL DECLARATIONS *****%
```

```
TERMINAL RJSYSTEM:                    % RJE CONTROLLER TERMINAL
DEFAULT      = RJETERMDEF;
LINWIDTH     = 255;
MAXINPUT     = 255;
MAXOUTPUT    = 255;
```

```
TERMINAL RJESPOTERM:                  % RJE SPO TERMINAL
DEFAULT      = RJETERMDEF;
```

RJE REFERENCE MANUAL

```

LINEWIDTH      = 72;
MAXINPUT       = 150;
MAXOUTPUT      = 150;

```

```

TERMINAL RJEPRINTERTERM:          % RJE LINE PRINTER TERMINAL

```

```

    DEFAULT      = RJETERMDEF;
    LINEWIDTH    = 132;
    MAXINPUT     = 420;
    MAXOUTPUT    = 420;

```

```

TERMINAL RJEREADERTERM:           % RJE CARD READER TERMINAL

```

```

    DEFAULT      = RJETERMDEF;
    LINEWIDTH    = 80;
    MAXINPUT     = 420;
    MAXOUTPUT    = 420;

```

```

TERMINAL RJEFTSTERM:              % RJE FILE TRANSFER TERMINAL

```

```

    MAXINPUT     = 2200;
    MAXOUTPUT    = 2200;

```

```

%***** RJE VIRTUAL AND PSEUDO STATIONS TERMINALS *****%

```

```

TERMINAL VSRJETERM:              % RJE VIRTUAL STATION TERMINAL

```

```

    DEFAULT      = RJETERMDEF;
    LINEWIDTH    = 80;
    MAXINPUT     = 1920;
    MAXOUTPUT    = 1920;
    PAGESIZE     = 24;
    WRAPAROUND   = TRUE;

```

The RJE family terminal names start with the letters "RJE" (RJESYSTEM through RJEFTSTERM in this example); the virtual station terminal name starts with letters different from "RJE" (VSRJETERM in this example).

Station Declarations

```
%DEFAULT STATION DECLARATION
```

```
DEFAULT STATION RJEStADEf:
```

```
% DEFAULT RJE STATION
```

```

    EDITOR       = RJE;
    CONTROL      = 8'?'';
    MCS          = "SYSTEM/RJE";
    ALGORITHM     = RJECONTROL;
    INITIALIZE    TALLY:= 0 & 0 & 0. TOGS := 0.
                  APPLICATION:= RJE_EDITOR;

```

```
%SYS7 RJE STATIONS FOR RJE TO SYS456
```

```
STATION RJETOSYS456:
```

```
% RJE TO SYSTEM 456
```

```

    DEFAULT      = RJEStADEf;
    ADDRESS      = RECEIVE: "00", TRANSMIT: "00";
    TERMINAL     = RJESYSTEM;

```

```
STATION RJEsp01:
```

```
% RJE SPO STATION
```

NDL/NDLII Definitions

```

DEFAULT      = RJESTADEF;
ADDRESS      = RECEIVE: "01", TRANSMIT: "01";
TERMINAL     = RJESPOTERM;

STATION RJEREADER1:                                % RJE CARD READER STATION
DEFAULT      = RJESTADEF;
ADDRESS      = RECEIVE: "02", TRANSMIT: "02";
TERMINAL     = RJEREADERTERM;

STATION RJEPRINTER1:                              % RJE LINE PRINTER STATION
DEFAULT      = RJESTADEF;
ADDRESS      = TRANSMIT: "03", RECEIVE: "03";
TERMINAL     = RJEPRINTERTERM;

STATION RJEFIS1:                                  % RJE FILE TRANSFER STATION
DEFAULT      = RJESTADEF;
ADDRESS      = TRANSMIT: "04", RECEIVE: "04";
TERMINAL     = RJEFISTERM;

%SYS7 RJE VIRTUAL STATIONS FOR TERMINAL TRANSFER TO SYS456
STATION RJEVSIN1:                                % RJE INPUT VIRTUAL STATION 1
DEFAULT      = RJESTADEF;
ADDRESS      = RECEIVE: "aA", TRANSMIT: "Aa";
TERMINAL     = VSRJETERM;

STATION RJEVSIN2:                                % RJE INPUT VIRTUAL STATION 2
DEFAULT      = RJESTADEF;
ADDRESS      = RECEIVE: "bA", TRANSMIT: "Ab";
TERMINAL     = VSRJETERM;

STATION RJEVSOUT1:                               % RJE OUTPUT VIRTUAL STATION 1
DEFAULT      = RJESTADEF;
ADDRESS      = RECEIVE: "Aa", TRANSMIT: "aA";
TERMINAL     = VSRJETERM;

STATION RJEVSOUT2:                               % RJE OUTPUT VIRTUAL STATION 2
DEFAULT      = RJESTADEF;
ADDRESS      = RECEIVE: "Ab", TRANSMIT: "bA";
TERMINAL     = VSRJETERM;

STATION RJEVSOUT3:                               % RJE OUTPUT VIRTUAL STATION 3
DEFAULT      = RJESTADEF;
ADDRESS      = RECEIVE: "Ac", TRANSMIT: "cA";
TERMINAL     = VSRJETERM;

STATION RJEVSOUT4:                               % RJE OUTPUT VIRTUAL STATION 4
DEFAULT      = RJESTADEF;
ADDRESS      = RECEIVE: "Ad", TRANSMIT: "dA";
TERMINAL     = VSRJETERM;

STATION RJEVSOUT5:                               % RJE OUTPUT VIRTUAL STATION 5
DEFAULT      = RJESTADEF;
ADDRESS      = RECEIVE: "Ae", TRANSMIT: "eA";

```

RJE REFERENCE MANUAL

TERMINAL = VSRJETERM;

```

STATION RJEVSOUT6:                                % RJE OUTPUT VIRTUAL STATION 6
  DEFAULT      = RJESTADEF;
  ADDRESS      = RECEIVE: "Af". TRANSMIT: "fA";
  TERMINAL     = VSRJETERM;

```

%SYS7 RJE PSEUDO-STATIONS FOR TERMINAL TRANSFER TO SYS456

```

STATION RJPSEUDO1:                                % RJE PSEUDO STATION 1
  DEFAULT      = RJESTADEF;
  ADDRESS      = RECEIVE: "09". TRANSMIT: "09";
  TERMINAL     = VSRJETERM;

```

```

STATION RJPSEUDO2:                                % RJE PSEUDO STATION 2
  DEFAULT      = RJESTADEF;
  ADDRESS      = RECEIVE: "09". TRANSMIT: "09";
  TERMINAL     = VSRJETERM;

```

As for the B 6800 declarations in the NDL example in this appendix, eight virtual stations, two for input (RJEVSIN1 and RJEVSIN2) and six for output (RJEVSOUT1 through RJEVSOUT6), plus two pseudo-stations (RJPSEUDO1 and RJPSEUDO2) are declared, allowing up to two terminals that were transferred from SYS456 (the B 6800 system) to be attached to MCSs on SYS7 (the B 6900 system).

Line Declaration

%LINE FOR RJE TO SYS456

```

LINE RJETO456:                                % RJE LINE - TDI
  ALGORITHM    = RJECONTROL;
  CLASS        = RJE4800CLASS;
  STATIONS     = RJETOSYS456,RJESPO1,RJEREADER1,RJEPRINTER1,RJEFTS1,
                RJEVSIN1,RJEVSIN2,RJEVSOUT1,RJEVSOUT2,RJEVSOUT3,
                RJEVSOUT4,RJEVSOUT5,RJEVSOUT6,RJPSEUDO1,RJPSEUDO2;
  TIMEOUT      = 1500;
  TRANSMITDELAY= 40;

```

The line declared in this example connects the two systems.

HARDWARE DEFINITION:

```

NSP 108:                                % VISIBLE TO HOST SYS7
EDITOR    = PAPERTAPE. LOGICALID, RJE;
LSP 112:
    ALTERNATES = HOST 109;
    ADAPTOR 0:                            % OTHER LINES
        .
        .
        .
    ADAPTOR 5: RJETO456;                  % FILE TRANSFER TO 456
                                           % CHAR LA
                                           % PRIVATE

```



UNDERSTANDING RAILROAD DIAGRAMS

WHAT IS A RAILROAD DIAGRAM?

A railroad diagram is a way of representing the syntax of a command or statement graphically. It shows which items are required or optional, the order in which they should appear, how often you can repeat them, and any required punctuation.

HOW TO READ A RAILROAD DIAGRAM

Normally, you read a railroad diagram from left to right. However, there are some exceptions; in those cases, arrows indicate a right-to-left direction.

If a diagram is too long to fit on one line and must continue on the next, a right arrow (>) appears at the end of the first line and another at the beginning of the next line, like this:

```
----->
>-----
```

The end of a railroad diagram is denoted by a vertical bar (|) or percent sign (%). The vertical bar means the command or statement can be followed by a semicolon and another command or statement. The percent sign means the command or statement must be on a line by itself.

CONSTANTS AND VARIABLES

Consider a hypothetical command for giving instructions to a house painter:

```
-- PAINT ----- LIVING ROOM ---<color>--|
      |         | |
      |- THE -| |- DINING ROOM -|
              | |
              |- BEDROOM -----|
              | |
              |- BATHROOM -----|
              | |
              |- KITCHEN -----|
```

This command tells the painter to paint a designated room in the color you specify.

The example introduces two important features of railroad diagrams:

- Constants
- Variables

Constants

Constants are items that you cannot vary. You must enter a constant as it appears in the diagram, either in full or abbreviated. If you abbreviate a constant, you must enter everything that is underlined in the railroad diagram, optionally followed by one or more of the remaining characters.

You can recognize constants in railroad diagrams by the fact that they are never enclosed in angle brackets.

In the example, the word PAINT is a constant. You could enter PAINT in full or abbreviate it to PAI or PAIN, but not to PA or PAN. If no part of the constant is underlined, you cannot abbreviate it at all.

Variables

Variables are items that you can replace with other data to suit a particular situation: that is, you can vary the information you enter in place of the variable, subject to rules defined for the particular command or statement.

Variables appear in a railroad diagram enclosed in angle brackets (<>).

In the example, <color> is a variable item. If the description of the PAINT command defines the allowable colors as BLUE, GREEN, PINK, and YELLOW, you can enter any one of these in your command.

Understanding Railroad Diagrams

FOLLOWING THE PATHS OF A RAILROAD DIAGRAM

The paths of a railroad diagram lead you through the diagram from beginning to end. They are represented by horizontal and vertical lines.

A path shows the allowable syntax. Some diagrams have just one path that goes from the beginning to the end of the diagram. Others contain several paths, each covering a part of the diagram. A path shows which items you can include in a command or statement, which you can omit, and the number of times you can include a particular item or group of items.

To follow a path through a railroad diagram, you need to understand the items you may encounter along the way. These items are

- Required items and punctuation
- Optional items
- Loops

A description of each item follows.

Required Items and Punctuation

Required items and punctuation must be entered in the command or statement; you cannot omit them. A required item appears by itself in a path (horizontal line). A required item can be either a constant or a variable. For example, if a railroad diagram indicates

```
-- PAINT -- BEDROOM --<color>--|
```

the words PAINT and BEDROOM are required constants, and <color> is a required variable. You could correctly enter

```
PAINT BEDROOM BLUE
```

but not

```
PAINT BEDROOM
```

because the required item <color> would be missing.

Optional Items

Optional items appear one below another in a vertical list. You can choose any one of the items in the list. If the list also contains an empty path (all dashes), you can omit the item entirely. An optional item can be either a variable or a constant. The PAINT command in the example contains two lists. The first is

```

-----|
|      |
|- THE -|

```

which gives you two options:

- Enter the constant THE
- Omit it (because there is an empty path)

The second list has five optional constants:

```

---- LIVING ROOM ----|
|                     |
|- DINING ROOM -|
|                     |
|- BEDROOM ----|
|                     |
|- BATHROOM ----|
|                     |
|- KITCHEN ----|

```

You must enter one of the optional items (LIVING ROOM, DINING ROOM, BEDROOM, BATHROOM, or KITCHEN) because there is no empty path in this list.

Loops

A loop is an item or group of items that you can repeat. The number of repetitions allowed is controlled by an item called the bridge.

Understanding Railroad Diagrams

A loop can span all or part of a railroad diagram. It always consists of at least two horizontal lines, one below the other, like this:

```

      |<----- <return character> -----|
      |                                     |
-----<bridge>--<content of the loop>-----

```

or

```

      |<-- <bridge> -- <return character> --|
      |                                     |
----- <content of the loop> -----

```

The bridge shows the maximum number of times you can go through the loop. The bridge can precede the contents of the loop, or it can precede the return character on the upper line of the loop to specify the number of times the right-to-left path can be traversed. The bridge is an integer enclosed in sloping lines, / \, for example, /4\. Not all loops have bridges. Those that do not can be repeated any number of times.

The top line is a right-to-left path that contains information about repeating the loop. The return character is the character to use before each repetition of the loop (often, a comma). Not all loops contain a return character; if none is shown, just enter one or more spaces before repeating the loop.

The other lines show the content of the loop (the data you enter each time you go through the loop). This can be any combination of optional items, required items, lists, and even other loops. The content of a loop can range from simple (one item), to very complex (many items, lists, and loops).

Example 1. A Simple Loop

The PAINT command as first shown is of limited usefulness. To tell the painter to do several rooms, you need a separate command for each room. It would be much easier if you could tell him to do several rooms in one command.

You can do that by making the list of rooms into a loop. The command would then look like this:

RJE REFERENCE MANUAL

```

      |<----- , -----|
      |                     |
-- PAINT -----/5\--- LIVING ROOM -----<color>---|
      |         |         |         |         |
      |- THE -|         |- DINING ROOM -|
      |         |         |         |         |
      |         |         |- BEDROOM ----|
      |         |         |         |         |
      |         |         |- BATHROOM ----|
      |         |         |         |         |
      |         |         |- KITCHEN ----|

```

The bridge has a value of 5, so you can go through the loop up to five times, for a total of five rooms. The return character is a comma, which you must enter before repeating the loop content.

You can now enter

PAINT THE LIVING ROOM, BEDROOM, KITCHEN YELLOW

or

PAINT DINING ROOM, BEDROOM, BATHROOM BLUE

or

PAINT BEDROOM PINK

or

PAINT BEDROOM, BATHROOM, BEDROOM, BEDROOM BLUE

or any other valid combination.

This simple loop makes the PAINT command more versatile, but a significant drawback remains. Although you can include up to five rooms in a command, you cannot specify different colors.

Understanding Railroad Diagrams

Example 2. A More Complex Loop

If the content of the loop were to include the color, you could specify a different color for each room.

```

                                |<----- , -----|
                                |
-- PAINT -----/5\--- LIVING ROOM ---<color>-----|
      |         |         |         |
      |- THE -|         |- DINING ROOM -|
                                |
                                |- BEDROOM -----|
                                |
                                |- BATHROOM -----|
                                |
                                |- KITCHEN -----|

```

The content of the loop now consists of the

- List of optional constants that indicate rooms
- Required variable <color>

The bridge value is 5, and the return character is a comma. Given this railroad diagram, some valid PAINT commands would be

PAINT THE BEDROOM PINK

PAINT THE LIVING ROOM BLUE, DINING ROOM GREEN, KITCHEN YELLOW

PAINT BEDROOM GREEN, KITCHEN BLUE

and so on.

Example 3. Another Loop

In some bridges an asterisk follows the number. For example,

```

      |<-/4*\----- , -----|
      |
-- PAINT ----- LIVING ROOM ---<color>-----|
      |         |         | |
      |- THE -|         |- DINING ROOM -|
      |         |         |
      |         |         |- BEDROOM -----|
      |         |         |
      |         |         |- BATHROOM -----|
      |         |         |
      |         |         |- KITCHEN -----|

```

The asterisk means you must take the right-to-left path at least once. You cannot, for example, enter PAINT BEDROOM BLUE; you must tell the painter at least two rooms to paint. The maximum number of rooms to be painted is still five: the first time through the loop with up to four repetitions.

A valid form of the command would be

PAINT BEDROOM BLUE, KITCHEN YELLOW

Example 4. Another Use of the Bridge

A bridge can also control the number of times you take an individual path within a loop. For example, another command to the painter might be:

```

-- WORK -----|
      |         |
      | |<-----| |
      | |         | |
      |-----/1\- EVENINGS -----|
      |         |
      |-----/1\- WEEKENDS -|
      |         |
      |-----/1\- HOLIDAYS -|

```

Understanding Railroad Diagrams

Each bridge /1\ indicates you can take that path once or not at all. That is, you can enter each of the items EVENINGS, WEEKENDS, and HOLIDAYS once at most. Some valid commands are

WORK EVENINGS WEEKENDS HOLIDAYS

WORK WEEKENDS

WORK HOLIDAYS EVENINGS

but

WORK EVENINGS EVENINGS

is invalid.

A FINAL WORD

To familiarize you with railroad diagrams, this explanation describes the elements of the diagrams and gives a few simplified examples. Some of the actual diagrams you will encounter in a book may be considerably more complex.

However, the principles are the same no matter how complex the diagram. The more you work with railroad notation, the more easily you will understand even the most complex diagrams.



GLOSSARY**accesscode**

One of a list of names that can be specified in the USERDATAFILE as "17398000" along with a usercode/password combination (and, possibly, with an associated password of its own) when logging on to RJE.

acknowledgement received message (ARM)

Indicates positive or negative acknowledgement of the previous message received.

ACU

See "Automatic Calling Unit."

address

A unique sequence of characters used to identify a station or group of stations.

algorithm

A block in an NDLI program that contains the Line Control and Adaptor Control procedures for a single line and handles the line protocol for that line.

American Standard Code for Information Interchange (ASCII)

A seven- or eight-level code representing a set of 128 control and graphic characters.

APL

See "A Programming Language."

A Programming Language

A procedure-oriented language used to express procedures for solving problems.

ARM

See "acknowledgement received message."

ASCII

See "American Standard Code for Information Interchange."

asynchronous transmission mode

A mode of data transmission in which the time of the occurrence of each character or block of characters is arbitrary. Once started, the time of occurrence of each signal representing a bit within the character or block has the same relationship to significant instants of a fixed time frame.

Automatic Calling Unit (ACU)

A device that permits a data terminal to dial calls automatically and, in this way, to establish a dialed link over the communications network.

backup file

A printer or punch file assigned to a backup peripheral (by default, disk).

BCC

See "block check character."

BCL

See "Burroughs Common Language."

Glossary

beginning-of-job (BOJ)

A control code that signals the beginning of a job.

beginning-of-task (BOT)

A control code that signals the beginning of a task.

bits per second (BPS)

In serial transmission, the instantaneous bit speed with which a device or channel transmits a character.

block

A group of characters or bits sent as an integral information unit.

block check character (BCC)

A character appended to transmitted data blocks, used for error detection and parity control.

blocking factor

The number of logical records stored in a physical record.

BOJ

See "beginning-of-job."

BPS

See "bits per second."

BOT

See "beginning-of-task."

buffer

A device used for temporary storage during the transfer of data from one device to another.

Burroughs Common Language (BCL)

A 6-bit, alphanumeric code used for internal data representation.

CANDE

See "Command AND Edit" language.

carrier frequency

A continuous frequency that can be modulated, or impressed, with a second, information-carrying signal.

character

A set of bits arranged in an orderly group to represent digits, symbols, or letters.

COBOL

Common Business-Oriented Language.

Command AND Edit (CANDE) language

A Burroughs Message Control System (MCS) that provides generalized file preparation and updating capabilities in an interactive, terminal-oriented environment.

connection

The established path between two or more terminal installations. A permanent connection is established without using switched facilities; a temporary connection is established using switched facilities.

Glossary

contention mode

A line condition in which no station is designated a master station, and each station on the line must monitor signals on the line and wait for an idle condition before bidding for master status.

control character

A functional character that controls or facilitates transmission of information over communications networks.

control message

In RJE, a message used to interrogate or control RJE activity.

CONTROLLER

The part of the Master Control Program (MCP) responsible for queue-level scheduling and communications with the system operator.

Data Communications ALGOL (DCALGOL)

A high-level Burroughs language used to write Message Control Systems (MCSs) and other specialized system programs.

Data Communications Controller (DCC)

A subset of the Master Control Program (MCP), operating as a group of independent tasks or stacks, each associated with one Data Communications Processor (DCP), which is the basic interface between the datacomm subsystem and the main system.

Data Communications Processor (DCP)

The processor that executes instructions compiled from a Network Definition Language (NDL) source program to control the datacomm network.

data set

A device serving as an interface between a line and a station (for example, a modem).

DCALGOL

See "Data Communications ALGOL."

DCC

See "Data Communications Controller."

DCP

See "Data Communications Processor."

DCWRITE

A Data Communications ALGOL (DCALGOL) intrinsic that passes a specified message to the Data Communications Controller (DCC).

dial-in

Use of a dial or push button data set to establish a switched connection. (Synonymous with "dial-up.")

drop

A connection made available for a terminal on a line.

EBCDIC

See "Extended Binary Coded Decimal Interchange Code."

Extended Binary Coded Decimal Interchange Code (EBCDIC)

An 8-bit code representing 256 graphic characters.

Editor

A Network Definition Language II (NDLII) utility that defines an input process and an output process that implement application-dependent editing on the text portions of input and output messages according to the requirements of particular terminal types.

Glossary

end-of-file (EOF)

A control code at the end of a data file that signals that the last record in the file has been processed.

end-of-job (EOJ)

A control code that tells the receiver that the job is completed.

end-of-task (EOT)

A control code that tells the receiver that the task is completed.

EOF

See "end-of-file."

EOJ

See "end-of-job."

EOT

See "end-of-task."

fetch operation

An operation in which a file is obtained from a remote host.

file transfer

The transfer of files between two host systems, or between a host system and a terminal, using RJE.

file transfer link

An input virtual station used for RJE file transfer.

File Transfer Status (FTS)

A control message that monitors file transfer activity.

FORMMESSAGE

An attribute whose value is a string that associates the printer containing the value with output files that specify that value.

FTS

See "File Transfer Status."

GEMCOS

See "Generalized Message Control System."

Generalized Message Control System (GEMCOS)

A Burroughs Message Control System (MCS) developed for on-line, multi-task Message-Level Interface Processor (MLIP) systems. GEMCOS is transaction-oriented.

Halt/Load

A system-initialization procedure that loads a fresh version of the Master Control Program (MCP) from disk or pack to main memory.

header

A sequence of characters preceding the text of a message, containing routing or other communication-related information.

input message

In RJE, a message beginning with an asterisk (*) that is handled directly by RJE.

Glossary

input/output (I/O)

An operation in which the system reads data from or writes data to a peripheral device such as a disk drive.

interrupt

An interruption in the normal system or program flow that allows this flow to be resumed later at the point of interruption. Interrupts are initiated by signals from outside the computer system that synchronize the operations of the various system components.

I/O

See "input/output."

leased line

A nonswitched connection established for the exclusive use of two stations.

line

A data transmission line linking two computers or a computer and its associated terminals.

line control procedure

In the Network Definition Language (NDL), a procedure that determines the order in which stations receive attention and the functions to be performed for each station.

Line Support Processor (LSP)

On the Message-Level Interface Processor (MLIP) systems, the datacomm subsystem processor that manages communications with the host and initiates processes that control input of messages to, and output of messages from, datacomm lines.

linkfile

A disk file that saves information regarding RJE terminals (including run-time terminal options, usercodes, and phone numbers) to use for recovery in the event of a Halt/Load.

log-on

The process by which a user is identified as a valid user by entering a valid usercode/password/accesscode combination to RJE.

logical station number (LSN)

A unique integer assigned in Network Definition Language (NDL) to each station in a network.

LSN

See "logical station number."

Master Control Program (MCP)

The operating system for Burroughs computers that controls the A Series systems. It provides complete management of all system resources and tasks.

MCP

See "Master Control Program."

MCS

See "Message Control System."

message

A sequence of bits arranged in a form suitable for conveying information from an originator to one or more destinations or addresses. A message contains the information (known as the "text" portion of the message) and may, in addition, contain communication information to aid in the routing or handling of the message (known as the "header" of the message).

Message Control System (MCS)

A special-purpose Data Communications ALGOL (DCALGOL) program that controls the flow of messages between terminals and the main system. Burroughs MCSs include SYSTEM/CANDE, SYSTEM/RJE, SYSTEM/GEMCOS, and SYSTEM/DIAGNOSTICMCS.

Message-Level Interface Processor (MLIP)

The input/output (I/O) processor housed in the central processing unit on MLIP systems (B 5900 and B 6900).

MLIP

See "Message-Level Interface Processor."

modem

A device that modulates and demodulates signals transmitted over communications facilities.

MPX

See "multiplexor."

multiplexor (MPX)

A device that controls the operation of all the peripheral subsystems on a B 6800 system except Data Communications Processors (DCPs).

NDL

See "Network Definition Language."

NDLII

See "Network Definition Language II."

Network Definition Language (NDL)

The Burroughs language used to physically, logically, and functionally describe the datacomm subsystem on Data Communications Processor-based (DCP-based) systems (B 6700, B 6800, B 7700, and B 7800 systems).

Network Definition Language II (NDLII)

The Burroughs language used to physically, logically, and functionally describe the datacomm subsystem on Network Support Processor/Line Support Processor-based (NSP/LSP-based) systems (B 5900 and B 6900 systems).

NIF

See "Network Information File."

Network Information File (NIF)

The file generated from a Network Definition Language (NDL) or Network Definition Language II (NDLII) program compilation.

Network Support Processor (NSP)

On Message-Level Interface Processor (MLIP) systems, the datacomm subsystem processor that controls the Message Level Interface (MLI) and handles the code for line-control and editor procedures generated by the Network Definition Language II (NDLII) compiler.

noise

Any signal present on a line other than the desired signal.

non-peer host

In RJE terms, a host of a different software type than the host connected to it (for example, a B 2000/B 3000/B 4000 Series system connected to an A Series system).

NSP

See "Network Support Processor."

ODT

See "Operator Display Terminal."

Operator Display Terminal (ODT)

The system console device that allows the operator to enter commands directly to the system to perform various functions.

parity

An error-detection method that tests whether the number of ones or zeros in an array of bits is odd or even. Horizontal parity checks verify the validity of individual characters in a data block. Vertical parity checks use the appended block check character (BCC) to cumulatively verify the validity of all preceding characters in the block.

parity check

A check that tests whether the number of ones or zeros in an array of bits is odd or even.

password

One of a list of names associated with each usercode or accesscode in the USERDATAFILE, identifying the user as a valid user. A password is required along with a usercode when logging on to RJE.

path

A route between any two nodes.

PATHCONTROL

The origination word in the task of a process, containing information concerning the origination of the task along with information describing the destination of any printer or punch backup.

peer host

In RJE terms, a host of the same software type as the host connected to it (for example, an A Series system connected to another A Series system).

polling

The process of inviting data stations to transmit, one at a time.

pseudo-station

A device used by a remote host to transfer data from the RJE file transfer link (input virtual station) to a station controlled by another Message Control System (MCS) such as CANDE or APL. A pseudo-station has the same characteristics as a virtual station, except that the device addresses are "09". "09". Refer to "virtual station."

put operation

An operation in which a file is placed on a line for transmission to a remote host.

queue array reference

An identifier declared in Data Communications ALGOL (DCALGOL) to reference a queue array (an array in main memory containing information about a DCALGOL physical queue).

remote computer

A system whose components are viewed by the main system as a set of stations on a line controlled by RJE.

Remote Job Entry (RJE)

A system that enables distant locations to input data to a central data processing system and to receive the required output.

Glossary

Remote Supervisory Console (RSC)

A terminal released to RJE that provides a remote operator/system interface through input and output messages.

request procedure

Network Definition Language (NDL) line protocols used to communicate with the various terminal types in a datacomm network.

RJE

See "Remote Job Entry."

RSC

See "remote supervisory console."

SCTABLEGEN

A system table-generating program that creates a table of recognized commands for the Master Control Program (MCP) CONTROLLER.

secured-terminal environment

An environment in which every user of an RJE terminal is required to supply the Message Control System (MCS) with an acceptable usercode and password and, possibly, with an acceptable accesscode (with or without associated password).

snapshot

A hard copy of specified arrays obtained when the RAID compile-time option is set.

SPO

See "Supervisory Printer Output."

station

The functional units constituting a data terminal, the Data Terminal Equipment (DTE), and their common interface.

status

The capability, at a given instant, of a station to transmit or receive data.

Supervisory Printer Output (SPO)

An attribute in the Network definition Language (NDL) and Network Definition Language II (NDLII) used to assign or remove control station status.

swap space

The area of main memory used for job swapping. Refer to the "System Software Utilities Reference Manual" section titled "SWAPPER" for a description of job swapping.)

switched line

A line on which a temporary communications channel has been established.

SYCOM

See "System Communications Module."

System Communications Module (SYCOM)

A B 1000 system program that provides file transfer, interprogram communication, remote-supervisory, and remote job entry capabilities.

synchronous transmission mode

A mode of data transmission in which the time of the occurrence of each signal representing a bit is related to a fixed time frame.

system input message

In RJE, Remote Supervisory Console (RSC) input message handled directly by the Message Control Program (MCP).

terminal

An input/output (I/O) device designed to receive or send source data in a datacomm network.

terminal transfer

Connection through RJE of a terminal on one host to an interactive application program on another host, at which point, the terminal is used as if it were locally attached to the program.

text

The part of a message containing substantive information or higher-level control.

throughput

The total useful information processes during a specified time period.

turnaround

The operation of reversing the direction of transmission from send to receive or from receive to send.

turnaround time

The time required to reverse the direction of transmission from send to receive or from receive to send.

usercode

An entry in the USERDATAFILE identifying the user as a valid user and identifying files in the user's library.

USERDATAFILE

A system data base that defines valid usercodes and contains data about the population of users for a particular installation.

virtual station (VS)

A station declared in the Network Definition Language (NDL) for both hosts connected to the same line as the RJE family. Terminal data conveyed between hosts during terminal transfer uses the device address fields (DA1 and DA2) of a virtual station.

VS

See "virtual station."

WFL

See "Work Flow Language."

Work Flow Language (WFL)

The Burroughs language used to write jobs that control the flow of programs and tasks on the system.

Index

A, 187
 ABORT control message
 function, 38
 syntax diagram, 107
 <accesscode>, 54
 ACCESSCODE, 140
 ACCESSCODENEDED indicator, 24
 ACCESSDEFAULT, 25, 140
 (RESET). 167
 ACK
 line routine feature, 10
 valid message received, 12
 Acknowledgement received message, 14
 ACU, 38, 94. See also Automatic Calling Unit
 ADDLINFC, 159
 ARM, See Acknowledgement received message
 <arrayname>, 110
 ASCII characters
 ARM, 14
 ESC(27), 16
 ETX, 16
 RS, 16
 SOH, 14
 STX, 15
 ASCII-67 message format, 14
 ATTACH
 syntax diagram, 109
 AUTOBACKUP, 94
 AUTODC, 51
 Automatic Calling Unit, 94
 AUTOPRINT, 31, 61
 AUTORECOVERY, 51
 AX, 188

B 771 example, 171
 BACKUP, 158
 Backup file handling, 31
 BACKUPDESTINATION, 155
 Basic concepts, 5
 Basic constructs, 183. See also Input messages, ODT
 BCC, See Block check character
 BCL, 22. See also Burroughs Common Language
 Beginning-of-job, 31
 BINARY option, 114
 BLKSZ, 90
 Block check character, 16
 BOJ, See Beginning-of-job
 BOJ/BOT message (variant = 8), 164
 <Boolean expression>, 157
 Buffer size values, defaults and limits, 90
 BUFSZ, 90

BUG, 110

option, 110

Burroughs Common Language, 22

BYE

command, 23

syntax diagram, 58

C, 188

CALLBACK, 94

Callback phone numbers, 49

CALLBACKRECORDLINK, 49

Card reader message, 28

CARDREADER, 23

Carriage control character, 15

CC1. See Carriage control character

CHARGEQ indicator, 24

CLEAR, 112

Communications line interface, 7

Compilation, 167

compiling the RJE MCS, 170

source RJE defines, 169

Compile-time options, 167

ACCESSDEFAULT (RESET), 167

LINEINFO (SET), 167

NDLLOGIN (SET), 167

NEWLINE (SET), 167

NOLOGON (RESET), 168

PASSLOWERCASE (RESET), 168

PASS96COLCARDS (RESET), 168

RAID (RESET), 168

RSC (RESET), 168

SPO (RESET), 169

STATIONID (RESET), 169

USER (RESET), 169

Compiling the RJE MCS, 170

CONTRBACKUP, 94, 96

Contention-mode routine, 8

Control messages, RJE, 29

ABORT

function, 38

syntax diagram, 107

ATTACH

syntax diagram, 109

BUG, 110

CLEAR, 112

COPY

error messages, 114

function, 38

syntax diagram, 113

DP, 117

FTS

function, 38

Index

Control messages, RJE (cont.)
 syntax diagram. 118
 HEADLINE. 121
 HELP. 123
 HI. 124
 LEVELS. 125
 OFFLINE
 function. 38
 syntax diagram. 125
 ONLINE
 function. 38
 syntax diagram. 128
 PH
 function. 38
 syntax diagram. 130
 QUIT. 132
 READY. 133
 RELEASE. 134
 RO. 135
 RSC. 136
 SAVE. 137
 SF
 function. 38
 syntax diagram. 138
 SO. 140
 SPO. 144
 SS. 145
 summary. 38
 TF
 function. 38
 syntax diagram. 146
 VS
 function. 42
 syntax diagram. 147
 WAIT. 149
 WHERE. 150
 WM. 152
CONTROLLER reply (variant = 3). 161
COPY
 error messages. 114
 function. 38
 syntax diagram. 113
COPYQUEUE. 49
 + 1. 50
CRUNCH. 34
CS. 189
CU. 189

Datacomm Controller (DCC). 18
Datacomm link, See Communications line interface
Datacomm network, formation of. 42
DA1/DA2 Device designation. 15

DBS. 190
DCALGOL
 type queues, 157
DCP and NDL (B 6700/B 6800), 17
Defines. RJE source, 169
Design considerations, 7
DESTISREMOTEF. 158
DESTMCSF, 154, 158
DESTNAME, 154
DESTSTATION. 154
DESTUNITF, 154
Device address characters, 15
 DA1, 15
 DA1/DA2 Device designation, 15
 DA2, 15
DISK. 31
DLBACKUP, 31
DP, 117
DQ, 190
DS, 191
 syntax diagram, 71
DUMP, 192
 <arrayname>, 110
Dump program, 70

EBCDIC, 114
End-of-job, 21, 94
End-of-task, 22
EOJ, 21, 94. See also End-of-job
EOT, 22. See also End-of-task
Error recovery and retry capabilities, 8
ESC, 16
ETX, 16

FA. 193
Family of stations, RJE
 CARDREADER, 23
 FTS, 23
 LINEPRINTER, 23
 PROCESSOR, 23
 RSC, 23
File transfer, 32
 abort conditions, 35
 error message format, 35
 initiation, 33
 recovery, 36
 required conditions, 37
 restrictions, 32
 security, 36
 restrictions, 36

Index

File transfer, RJE messages
 see Messages for file transfer, 37
 FILERFILE, 36
 FORM, 193
 FORMMESSAGE, 31
 FR, 193
 FTBLK, 90
 FTS, 23, 118
 FTS control message
 function, 38
 FTSSBUG, 110. See also BUG
 Functional interface, 17
 Datacomm Controller (DCC), 18
 NDL and DCP (B 6700/B 6800), 17
 NDLII and NSP/LSP (B 6900/B 5900), 18
 remote computer, 17
 RJE MCS, 19
 Functional interfaces, 7

Halt/Load
 effects, 46
 RJE restore, 46
 Halt/Load effects
 RJE link interruption message, 46
 Halt/Load restore, 46
 LINK disk file, 46
 HEADLINE, 121
 HI, 124, 194
 HN, 194
 Host-to-host communication, 32
 file transfer, 32
 abort, 35
 recovery, 36
 security, 36

IB, 195
 ID, 195
 IGNOREFM, 95
 Initialization, 21
 Input messages, 29
 RJE control messages, 29
 RSC input messages, 29
 ODT input messages, 30
 RJE input messages, 29
 Input messages, ODT
 A, 187
 AX, 188
 basic constructs, 183
 C, 188
 CS, 189
 CU, 189

Input messages, ODT (cont.)

- DBS, 190
- description, 30
- DQ, 190
- DS, 191
- DUMP, 192
- FA, 193
- FORM, 193
- FR, 193
- HI, 194
- HN, 194
- IB, 195
- ID, 195
- J, 196
- LJ, 197
- LOG, 197
- ML, 198
- MM, 198
- MSG, 198
- MX, 199
- NET, 200
- NS, 200
- ODT messages, 187
 - LL (B 500/B 6000 Series Systems with MPX), 197
- OF, 201
- OK, 201
- OL, 201
- OP, 202
- OT, 204
- PD, 205
- PER, 206
- PF, 206
- PR, 207
- PV, 207
- QF, 208
- QT, 208
- RM, 208
- S, 209
- SB, 210
- SC, 210
- SI, 210
- SL, 211
- SP, 211
- SQ, 212
- SS, 212
- ST, 213
- SUPPRESS, 214
- TD, 214
- TERM, 215
- TF, 216
- THAW, 216
- TI, 217
- UQ, 217

Index

Input messages, ODT (cont.)
 W, 218
 WM, 219
 WY, 220
Input messages, RJE, 41. See also Messages for terminal transfer
 BYE, 58
 DS, 71
 MCS activity control, 29
 NOPASSWORD, 78
 QT, 84
 types, 53
 RJE control messages, 53
 RJE input messages, 53
 system ODT input messages, 53
*ACCESS, 54
*BACKUP, 55
*CE, 60
*CHARGECODE, 65
*CLEAR, 66
*CT, 41, 67
*DL, 69
*DP, 70
*DT, 41, 72
*FM, 73
*LC, 75
*ME, 76
*PB, 79
*PER, 82
*PH, 83
*RE, 41, 85
*RO, 87
*RS, 88
*SB, 89
*SF, 90
*SM, 92
*SO, 94
*SP, 96
*SS, 98
*STATUS, 99
*TF, 101
*TO, 102
*US, 103
*WM, 104
INTERCOMQUEUES, 160
Interface messages, 159
 BOJ/BOT (variant = 8), 164
 CONTROLLER reply (variant = 3), 161
 format, 159
 next message (variant = 4), 162
 restarted message (variant = 10), 165
 RJE operator request (variant = 2), 160
 scheduled message (variant = 9), 165
 status change (variant = 6), 163

Interface messages (cont.)

- task message (variant = 5). 162
- unsolicited message (variant = 7). 164
- WFL card image (variant = 1). 159

Interface, MCP. See RJE/MCP interface

Interfacing, functional. See Functional interface

J, 196

Job decks, 157

QREMOVEWAIT, 157

LEVELS, 125

Line discipline, flow of, 11

Line interface implementation, 8

Line routine, 8

features, 10

Line throughput, 7

blocking of messages, 7

directional enhancement, 8

field compression/expansion techniques, 7

line turnaround per message, 7

LINEINFO (SET), 167

LINEPRINTER, 23

Linkfile, 46

discarding, 50

layout, 47

layout, records, 47

CALLBACKRECORDLINK, 49

COPYQUEUE, 49

COPYQUEUE + 1, 50

RESTARTRECORDLINK, 48

terminal information blocks, 48

linkfile information record, 47

RJE MCS, 46

LJ, 197

Local host, 39

Local messages, 23

LOG, 197

Log-on/log-off

messages, 24

Log-on/log-off, RJE, 21

Logging-on to RJE, 24

LOGONCHECK, 27

Master Control Program, 18

MAXNONRJETERMINALS, 169

MAXRJETERMINALS, 170

MAXTERMINALS, 169

MAXVIRTUALSTATIONS, 170

MCP, See Master Control Program

Index

MCS
 See Message Control System, 5
 Message Control System, 5
 Message format, 14
 Messages for file transfer, 37
 ABORT, 38
 COPY, 38
 FTS, 38
 OFFLINE, 38
 ONLINE, 38
 PH, 38
 RJE control messages, 38
 RJE messages, 37
 SF, 37, 38
 TF, 37, 38
 Messages for terminal transfer, 41
 RJE control message, 42
 VS, 42
 *CT, 41
 *DT, 41
 *RE, 41
 MESSER, 162
 <mix number>, 21
 ML, 198
 MM, 198
 MSG, 198
 MX, 199

 NAK, 12, See also Negative acknowledgement
 NDL and DCP (B 6700/B 6800), 17
 NDL TERMINALTYPE identifier, 23, See also Non-RJE terminals
 NDL/NDLII definitions, 221
 configuration, 221
 RJE NDL definitions B 6800
 control and request procedures, 222
 DCP declaration, 228
 line declarations, 227
 station declarations, 224
 terminal declarations, 222
 RJE NDL definitions B 6800 system, 222
 RJE NDLII definitions: B 6900, 229
 class declaration, 229
 editor and algorithm, 229
 Hardware definition, NSP/LSP, 233
 line declaration, 232
 station declarations, 230
 terminal declarations, 229
 NDLII and NSP/LSP (B 6900/B 5900), 18
 NDLLOGIN (SET), 167
 Negative acknowledgement, 12
 NET, 200
 NEWLINE (SET), 167

Next message (variant = 4), 162

NOLOGON (RESET), 168

Non-RJE terminals

- connection to the RJE MCS, 23

- NDL TERMINALTYPE identifier, 23

- return to the original MCS, 23

- BYE command, 23

- *RE command, 23

NOPASSWORD, 78

NS, 200

NSP/LSP, 229

- hardware definition, 233

NSP/LSP and NDIII (B 6900/B 5900), 18

ODT input messages

- See also Input messages, ODT, 183

ODT messages, 187. See also Input messages. ODT summaries, 183

ODT requests, 155

- backup, 158

- job decks, 157

OF, 201

OFFLINE

- function, 38

- syntax diagram, 125

OK, 201

OL, 201

ONLINE

- function, 38

- syntax diagram, 127

OP, 202

Operator request (variant = 2), 160

- message format, 160

ORGUNITF, 154

OT, 204

Output messages, 23

- local messages, 23

- log-on and log-off messages, 24

- RJE output messages, 28

- RSC output

- responses to RJE input messages, 28

- RJE status messages, 28

PACK, 31

PASSLOWERCASE (RESET), 168

<password>, 54

PASS96COLCARDS (RESET), 168

PATHCONTROL, 153. See also RJE/MCP interface

- format, 153

- parts

- high-order 24 bits, 153

Index

PATHCONTROL (cont.)
 low-order 24 bits, 153
 task attributes, 154
 BACKUPDESTINATION, 155
 DESTNAME, 154
 DESTSTATION, 154
 SOURCEKIND, 154
 SOURCESTATION, 154
 PD, 205
 PER, 206
 PF, 206
 PH
 syntax diagram, 130
 PH control message
 function, 38
 Positive acknowledgement, 12
 PR, 207
 PROCESSOR, 23
 Pseudo-station, 41
 characteristics, 41
 PV, 207

 QF, 208
 QREMOVEDWAIT, 157
 QT, 84, 208
 Queue array reference, 160. See also INTERCOMQUEUES
 Queued copy requests, 49
 QUIT, 132

 RAID (RESET), 168
 Railroad diagrams, explanation of, 235
 Records
 COPYQUEUE, 49
 FILER restart recovery records, 49
 (RECVSTORE), 49
 Recprds
 COPYQUEUE + 1, 50
 RECVSTORE, 49
 REMCP, 31
 REMCPxx, 158
 REMLP, 31
 REMLPxx, 158
 Remote Decks, 22
 Remote host, 17, 39
 Remote Job Entry, 1
 Remote Supervisory Console (RSC), 23
 REMOTEPUNCH, 95
 REMPRINTMASK, 158
 REMPUNCHMASK, 158
 restarted message (variant = 10), 165
 Restarting a session, conditions, 50

RESTARTRECORDLINK. See Linkfile

RJE. See Remote Job Entry

- family,formation of, 42

- log-on procedures, 24

- log-on/log-off, 21

- MCS, 19

- messages, See Messages for file transfer

- operator request (variant = 2), 160

- system

 - use in a secured-terminal environment, 24

- system configuration, 5

- system description, 5

RJE/MCP interface, 153

- interface characteristics, 153

- interface messages, 159

- MCP interface, 159

- ODT requests, 155

- PATHCONTROL task attributes, 154

- WFL compiler, 159

RM, 208

RO, 135

RS, 16

RSC, 23, See also Remote Supervisory Console (RSC)

RSC (RESET), 168

RSC control message, 136

RSC keyin statements, 29

RSC output messages, types, 28

Run-time terminal options, 94

- AUTOBACKUP, 94

- CALLBACK, 94

- CONTRBACKUP, 94

- IGNOREFM, 95

- REMOTEPUNCH, 95

S, 209

Sample RJE sessions, 171

- B 771 example, 171

- terminal and file transfer example, 176

SAVE, 137

SB, 210

SC, 210

scheduled message (variant = 9), 165

Security conventions, 21

SETUPINTERCOM, 160

SF, 37, See also Messages for file transfer

- function, 38

SF control message

- syntax diagram, 138

SI, 210

SL, 211

Snapshots, 110

SO, 140

Index

SO ACCESSCODE, 25
 SOH, 14
 Source RJE defines, 169
 MAXNONRJETERMINALS, 169
 MAXRJETERMINALS, 170
 MAXTERMINALS, 169
 MAXVIRTUALSTATIONS, 170
 SOURCEKIND, 154
 SOURCESTATION, 154
 SP, 211
 SPO, 144
 SPO (RESET), 169
 SQ, 212
 SS, 145, 212
 ST, 213
 <station name>, 99
 STATIONID (RESET), 169
 Status change (variant = 6), 163
 STX, 15
 SUMMARY, 158
 SUPPRESS, 214
 SYCOM, 114
 SYMBOL/SOURCENDLII, 18
 System Communications Module, 114
 System configuration, typical, 5
 System line configuration, RJE, 8
 System output messages, 28
 SYSTEM/RJE, 5
 SYSTEM/SCTABLEGEN, 23

Task message (variant = 5), 162
 TD, 214
 TERM, 215
 Terminal and file transfer example, 176
 Terminal information blocks, 48, See also Linkfile
 Terminal transfer, 39
 requirements, 39
 restrictions, 39
 virtual station, 39
 Terminal transfer session example, 42
 Terminal transfer, messages, See Messages for terminal transfer
 TF, 37, 216, See also Messages for file transfer
 TF control message
 function, 38
 syntax diagram, 146
 THAW, 216
 TI, 217
 TN, See Transmission number
 Transmission number, 14

Unsolicited message (variant = 7), 164

- UQ, 217
- USER (RESET), 169
- User interface, 21
 - Backup file handling, 31
 - Halt/Load effects, 46
 - host-to-host communication, 32
 - file transfer, 32
 - abort, 35
 - recovery, 36
 - security, 36
 - input messages, 29
 - messages for terminal transfer
 - Control messages, RJE, 42
 - Input messages, RJE, 41
 - output messages, 23
 - local messages, 23
 - log-on and log-off messages, 24
 - RJE output messages, 28
 - pseudo-station, 41
 - remote decks, 22
 - Remote Supervisory Console (RSC), 23
 - RJE Halt/Load restore, 46
 - RJE initialization, 21
 - RJE log-on/log-off, 21
 - RJE messages for file transfer, 37
 - RJE messages, 37
 - RJE messages for terminal transfer, 41
 - security conventions, 21
 - terminal transfer, 39
 - virtual station, 39
- <usercode specification>, 114

- Virtual station, 39
 - addressing scheme, 39
 - terminal types, 40
- VS
 - function, 42
 - syntax diagram, 147

- W, 218
- WAIT, 149
- WFL, 19. See also Work Flow Language
- WFL card image (variant = 1), 159
- WFL compiler, 157
- WFLCOMPILER[<LSN>], 22
- WHERE, 150
- WM, 152, 219
- Work Flow Language, 19
- WY, 220

Index

- *ACCESS, 53
- *BACKUP, 55
- *CE, 60
- *CHARGECODE, 65
- *CLEAR, 66
- *CT
 - function, 41
 - syntax diagram, 67
- *DL, 69
- *DP, 70
- *DT
 - function, 41
 - syntax diagram, 72
- *FM, 73
- *LC, 75
- *ME, 76
- *PB, 79
- *PER, 82
- *PH, 83
- *RE
 - function, 41
 - syntax diagram, 85
- *RO, 87
- *RS, 88
- *SB, 89
- *SF, 90
- *SM, 92
- *SO, 94
- *SP, 96
- *SS, 98
- *STATUS, 99
- *TF
 - syntax diagram, 101
- *TO, 102
- *US, 103
- *WM, 104

